Mc Graw Hill Education



# Program Overview + Digital Sampler

mheonline.com/Oklahoma

# **Program Overview + Digital Sampler**

Connecting math content, rigor, and adaptive instruction for student success.





## *Oklahoma Glencoe High School Math Series*

The accelerated pace of change in education over the last few years has created acute shifts in the delivery, consumption, and evaluation of mathematics education. As a result, educators need relevant content in multiple formats to engage students and focus on developing skills leading to achievement in the classroom and in the real-world.

Helping educators immerse students in math and prepare them for the future is what McGraw-Hill Education is all about. We deliver the most effective, innovative, and inspiring learning experiences for high school mathematics.

#### Featuring Three Math Programs ——





The Oklahoma Glencoe High School Math Series includes: Algebra 1, Geometry, and Algebra 2. The series includes everything you need to guide your students with materials that lead them to success in the classroom, and creates confidence in their future.





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## **Connect Math, Rigor, and Standards Practice**

Students' math abilities are as diverse as they are. Help them develop confidence with appropriately challenging math content.

As your partner in providing an effective learning environment for your students, our trusted content combined with diverse resources focuses on Oklahoma Academic Standards for Mathematics. Our program will challenge and develop students' critical thinking skills to provide learners with a deeper understanding and broader knowledge of math.

### Connect math in and outside your classroom using:

- **Student eBook** available in desktop and mobile versions for ease of use, anytime, anywhere.
- Oklahoma Interactive Student Guide to help develop students' conceptual understanding of mathematics.
- Chapter Projects to develop students' 21st century research skills.
- *ALEKS*<sup>®</sup> to experience adaptive learning technology that meets your students where they are academically to move them to where they need to go.



## **Ensure Your Students are Ready for the Oklahoma Standards**

Interactive and customizable, the resources built into your *Oklahoma Glencoe High School Math Series* give you access to all the tools necessary to develop students' next generation problem-solving skills and facilitate an enhanced understanding of new topics.

Help students increase their comfort level with new content as well as mathematics concepts and application with these innovative learning tools:

- McGraw-Hill Education **eLessons** projected on an interactive whiteboard as an in-class presentation tool to help students visualize math concepts.
- eSolutions to provide quick and efficient access to questions that reinforce lesson content.
- Our online **eAssessment** system presents you with practice questions to familiarize students for new assessments.

		TRY	Hello Glencoe Teacher   <u>My Profile</u>   <u>Help</u> Section: Test Generator マ
Student center Student center Stu	Question Sets       Image: Content         Image: Content       Image: Con	Click a link below or drag a test or question Create a new test Create a new question set	n set into this area.



## **Bring Math to Life**

With the *Oklahoma Glencoe High School Math Series* digital resources in ConnectED, you can create an interactive learning center and empower students to live the math through exploration and investigation!

# Draw out your students' excitement for math with *The Geometer's Sketchpad*®

This interactive learning tool challenges students to drag, sketch, and model activities to deepen their conceptual understanding and application of abstract math concepts.

Integrated at the lesson level are engaging exercises that increase comprehension of abstract math concepts by helping students:

- Formalize key concepts.
- Test mathematical hypothesis.
- Visualize abstract math concepts.





## Interactive Resources to Extend Learning

Help students deepen their understanding of math with truly interactive resources.

The **eToolkit** virtual manipulatives empowers students to take learning into their own hands with opportunities to modify concrete models and see how changes they make impact the formula.



**Personal Tutors** are embedded and available to students at point-of-use to explain math concepts and help them apply or review lesson material.



**BrainPOP**<sup>®</sup> supports individual and whole-class learning with animations that provide clear and concise explanations of select topics. Students can't help but be drawn in and you are fully supported with a variety of resources at your fingertips.

#### Personal Tutors





## **Drive Student Success**

*Oklahoma Glencoe High School Math Series* is designed for the success of math students at all levels. With adaptive and personalized instructional tools built into the program, you can take command, make data-informed decisions, and provide the individualized instruction each student needs.

### Differentiation Support That Adds Up

Confidently tailor your instruction with comprehensive materials to meet the individual learning needs of every student. Use the 3-Tier Rtl model, fully supported by your *Oklahoma Glencoe High School Math Series* to reach every student.

Spark excitement about the impact of math in the real world using these **Differentiated Instruction** resources:

- Recommendations to personalize instruction for every student.
- Leveled exercise sets, reference resources, and dynamic digital tools.
- Differentiated homework options.





# Trust ALEKS<sup>®</sup> to make informed instructional decisions.

With the purchase of *ALEKS*, you are enabled to find out where your students are to inform your decisions on where whole-class instruction begins. This adaptive, personalized learning solution uses artificial intelligence to predict what content students are ready to learn and easily target individualized instruction, remediation, and acceleration.



# Use precise and customized tests with eAssessment.

The simple and intuitive **eAssessment** interface makes it easy to create customized assessments, schedule homework, receive immediate results, and generate student proficiency reports.

Effectively and immediately provide support to improve achievement for every student.



## **Digital Resources Guide**

With the Oklahoma Glencoe High School Math Series, you'll be impressed with the breadth of digital resources you have access to with just a few clicks. Use this Digital Resources Guide to preview many of the robust technology tools your Oklahoma Glencoe High School Math program has to offer.

As you explore your math program, be sure to look for engaging animations and videos that make learning effortless. Interactive graphing and modeling tools reinforce understanding and build confidence. These are some of the many resources that make it easy for you to meet your classroom goals.



### **ConnectED** Your Digital Dashboard

Maximize your planning time with convenient, easy-to-use tools and teaching resources using the **ConnectED** online dashboard from any computer, anytime.

Access and customize videos, worksheets, and presentations to help you meet each student's diverse learning needs.

Use the calendar function to schedule student assignments and the Message Center to alert students of new assignments. End of chapter online assessments help you evaluate student's knowledge frequently and differentiate appropriately.

Students have their own online learning dashboard, ConnectED Student Center. Learning is enhanced for students using the ConnectED Student Center with access to a wide-range of helpful resources such as Personal Tutors and downloadable eBook.

Using the Message Center, students can interact with you to ask questions, make notes, complete assignments, and submit work assignments. **ConnectED Mobile App** gives you access anytime, anywhere.



menu	<b>L</b> Q
	STUDENT CENTER
Chapter 3 ▶ Lesson 3 ▶	eBook
	Lesson Resources
	Momework
	You have no assignments at this time.
Control Integri Cetty Integri	



ConnectED and ConnectED Mobile

## **Planning & Presentation Resources**

Prep, Plan, and Present

Create memorable learning experiences for your students using vital resources to prepare, plan, and present engaging lessons every day.

Use the lesson overview to review objectives and Oklahoma Academic Standards for Mathematics for each chapter to increase the time you have to focus on instruction.

Choose pre-built lesson plans or customize with videos, animations, and online activities to create interactive learning opportunities in various modalities to accommodate your students' diverse learning styles and personalities.

Each lesson includes scaffolding questions and digital integration suggestions to help you incorporate technology at your comfort level.





**Plan and Present** 



Interactive Classroom Interactive whiteboard ready presentation for the lessons.



To launch an invasion, you need a total of exactly 40 plants. If you want to spend all of your gold nuggets, how many tomato plants and corn plants should you buy?

#### Current Farm Status Total number of plants on farm: 0 Supply of gold nuggets: 1500

 $\left(1\right)$ 



#### eLessons

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Lessons containing interactive content, animations, and games.

## **Adaptive Technology**

### Learnsmart®

### Personalized Study Resources

*LearnSmart* provides adaptive, online practice on course topics that students will encounter on high-stakes assessments. By following a personalized study plan, each student will have visibility to topics they have mastered--as well as those that need refreshed. This valuable resource helps students and teachers maximize the time leading up to end-of-course or high-stakes assessments.

### **ALEKS®** Adaptive Technology for Students

Deliver a personalized learning path for every student in you classroom. An adaptive learning system, *ALEKS*<sup>®</sup> adjusts its presentation of content for each student based upon their demonstrated interaction with math content.

*ALEKS*<sup>®</sup> delivers periodic assessments with open-ended questions to continuously determine content each student is ready to learn. *ALEKS*<sup>®</sup> then presents content the student is ready to learn and helps advance students at their own pace.

ALEKS<sup>®</sup> powerful reporting tools help you identify students who need one-onone instruction and additional practice. ALEKS<sup>®</sup> empowers you to adjust your classroom needs by providing you with real-time data. Create custom reports on student progress, mastery, and time on task.



ACHIEVE Mastering the :	21st Century Asses	sments: Algebra 1			Amy koenigsknecht
		CHUUSE A LEAN	NING MISSION		
	Petsyon net learni learn h a more fice pl	ng miladon. Thia will help you red wry:	ANSWER 10 QUESTIONS CORRECTLY Get 10 questions correct In order to complete this learning mission. GIVE ME 20 minutes straight and see how for a porce in progress. ANSWER 4 QUESTIONS CORRECTLY IN A ROW Get 4 questions correct In a row in order to complete this learning mission. COMPLETE THE ASSIGNMENT Do the remaining work in one go instead of in a mainter churche.		Copyright 2014 McGraveHII Education, All rights reserved
ALEKS	Search fo	r Classes, Students and Assianments	s 🛛 🛛 I 🖻	Hello	<ul> <li>Community   Feedback</li> </ul>
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Math 144         Class Code:       Class Dura         XXXXX-XXXX       12/21/16 -         Course Product:       Class Grad         High School Geometry       Class Grad         Instructor:       Joe Smith	() 34 cion: 06/09/17 a:	352	69% Progress 352 of 510 Topics	ЗМ 1М 24 18 12 6 6	2W 1W 120 90 60 30
Class	Summary »	Select slice to see mast	View Full Report »	May	y 24 - May 30 View Full Report »
Ready to Learn		Progress Overall		Assignments	
Area involving inscribed figures	47% >	Highest	Lowest		Score Due Date
Word problem on density involving the volume of a rectangular solid	41% >	Mendes, Herbert K. Nguyen, David R.	1 92% 2 87%	Scheduled Assessment 3	0% 06/08/2017 83% 05/29/2017
Area involving rectangles and circles	38% >	Simpson, Jill J.	3 86% 4 86%	Homework 13	80% 05/22/2017
Area as probability	38% >	Nixon, Robert E. Henry, Karen L.	5 83% 6 83%	Homework 12	79%         05/15/2017           88%         05/08/2017
	View All »		View All »		View All »

**ADAPTIVE PRACTICE** 

## **Chapter-Level Resources**

### All the Resources for All the Chapters

Each chapter has resources to help you assess students' prior knowledge, preview chapter content, and tie it all together for your students.

Chapter-Level resources to engage students and assist you in leading the classroom include:

- Quizzes
- Worksheets
- Graphic novels
- Chapter projects

Help students prepare for future lessons with the Study Notebook. Students can organize notes and use the glossary worksheet to record and study chapter vocabulary. Use the Anticipation Guide to evaluate concepts students know about the subject.



#### **Chapter Readiness Quiz**

#### Chapter 5 Relationships in Triangles

1.	Solve $x + 17 > 39$ .	
	$\bigcirc$ A. $x > 56$	$\bigcirc$ B. $x < 22$
	$\bigcirc$ C. $x > 22$	$\bigcirc$ D. $x < 56$
	<u>Hint</u>	
2.	Solve $-15 \ge f - 21$ .	
	$\bigcirc$ A. $f \ge -6$	$\bigcirc$ B. $f \leq -6$
	$\bigcirc$ C. $f \ge 6$	$\bigcirc$ D. $f \leq 6$
	Hint	
3.	Solve 5 <i>b</i> < 35.	
	$\bigcirc$ A. $b < 7$	$\bigcirc$ B. $b \leq 7$
	$\bigcirc$ C. $b \ge 7$	$\bigcirc$ D. $b > 7$
	Hint	
p		

4. Make a conjecture based on the following information. For points A, B, and C, AB = 2, BC = 3, and AC = 4.

 $\bigcirc$  A. *A*, *B*, and *C* form on equilateral triangle.

- $\bigcirc$  B. *A*, *B*, and *C* form a right triangle.
- $\bigcirc$  C. A, B, and C are collinear.
- $\bigcirc$  D. *A*, *B*, and *C* are noncollinear.

Chapter Readiness Quizzes help students assess their knowledge of prerequisite skills for each chapter.

**Chapter Readiness Quiz** 



### **Relationships in Triangles**

Before You Read

Before you read the chapter, respond to these statements.

- 1. Write an A if you agree with the statement.
- $\mathbf{2.}$  Write a  $\mathbf{D}$  if you disagree with the statement.

Before You Read	Relationships in Triangles
	• Concurrent lines do not intersect and stay the same distance apart.
	• To find the incenter of a triangle, draw a circle within the triangle.
	• Every triangle has 3 medians that are concurrent.
	• The largest angle in a triangle is opposite the longest side.
	• The Hinge Theorem is a way of proving triangle relationships.

FOLDABLES Study Organizer Construct the Foldable as directed at the beginning of this chapter.

## Note Taking Tips

- When you take notes, include personal experiences that relate to the lesson and ways in which what you have learned will be used in your daily life.
- When you take notes, write questions you have about the lessons in the margin of your notes.

Then include the answers to these questions as you work through the lesson.

Chapter 5

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**Before Your Read** 

The Study Notebook Worksheet helps students organize their notes for understanding and quick retrieval of information.



Key Points

Scan the pages in the chapter and write at least one specific fact concerning each lesson. For example, in the lesson on medians and altitudes of triangles, one fact might be lines containing the altitudes of a triangle are concurrent, intersecting at a point called the orthocenter. After completing the chapter, you can use this table to review for your chapter test.

Lesson	Fact
5-1 Bisectors of Triangles	
5-2 Medians and Altitudes of Triangles	
5-3 Inequalities of One Triangle	
5-4 Indirect Proof	
5-5 The Triangle Inequality	
5-6 Inequalities in Two Triangles	
5-7 Congruence Transformations	
5-8 Triangles and Coordinate Proof	

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Chapter 5

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#### **Key Points**

The Study Notebook Worksheet helps students organize their notes for understanding and quick retrieval of information.

### **5 Student-Built Glossary**

This is an alphabetical list of the key vocabulary terms you will learn in Chapter 5. As you study the chapter, complete each term's definition or description. Remember to add the page number where you found the term. Add these pages to your Geometry Study Notebook to review vocabulary at the end of the chapter.

Vocabulary Term	Found on Page	Definition/Description/Example
altitude		
centroid		
circumcenter SUHR·kuhm·sen·tuhr		
concurrent lines		
incenter		
indirect proof		
nuncet proof		

Chapter 5

1

Glencoe Geometry

Student Built Glossary

The Student Built Glossary Worksheet provides a list of new vocabulary terms from the chapter. Students record definitions and/or examples for each term.

### **5** Anticipation Guide Relationships in Triangles

#### Step 1: Before you begin Chapter 5

- Read each statement.
- Decide whether you Agree (A) or Disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (Not Sure).

STEP 1 A, D, or NS	Statement	STEP 2 A or D
	1. Any point that is on the perpendicular bisector of a segment is equidistant from the endpoints of that segment.	
	2. The circumcenter of a triangle is equidistant from the midpoints of each side of the triangle.	
	<b>3.</b> The altitudes of a triangle meet at the orthocenter.	
	<b>4.</b> Three altitudes can be drawn for any one triangle.	
	<b>5.</b> A median of a triangle is any segment that contains the midpoint of a side of the triangle.	
	<b>6.</b> The measure of an exterior angle of a triangle is always greater than the measures of either of its corresponding remote interior angles.	
	7. The longest side in a triangle is opposite the smallest angle in that triangle.	
	<b>8.</b> To write an indirect proof that two lines are perpendicular, begin by assuming the two lines are not perpendicular.	
	<b>9.</b> The length of the longest side of a triangle is always greater than the sum of the lengths of the other two sides.	
	10. In two triangles, if two pairs of sides are congruent, then the measure of the included angles determines which triangle has the longer third side.	

#### Step 2: After you complete Chapter 5

- Reread each statement and complete the last column by entering an A or a D.
- Did any of your opinions about the statements change from the first column?
- For those statements that you m6ark with a D, use a piece of paper to write an example of why you disagree.

Chapter 5

3

Glencoe Geometry

#### **Anticipation Guide**

The Anticipation Guide is a survey used before beginning the chapter to pinpoint what students know about the concepts in the chapter. Students may revisit this survey after they complete the chapter to see if their perceptions have changed.

### **The Great Outdoors**

Biking, walking, hiking, skating...what is your favorite way to spend the day at the park? Keeping parks clean and safe requires careful management. A park manager directs the operation of a recreational area such as a park or wildlife preserve. They oversee park rangers and may also be involved in budgeting and planning for park projects.

In this project, you will work as a park manager to determine the best location for several new features of a park.



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#### Research

- Research a career as a park manager. Explore some aspects of the career such as job functions, required education, and potential earnings.
- Research the Sioux Strip State Wildlife Management Area. Obtain a map of the area.
- Research a park located close to your community. What activities/features are available at this park? Where are these activities/features located in the park?

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			ι.	
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#### **Brainstorm**

- Consider the types of features that would be useful in a state park. What activities/features are important to you?
- Consider the Sioux Strip State Wildlife Management Area. Determine potential locations for new features of the park.



#### Analyze

Analyze the Sioux Strip State Wildlife Management Area according to the park management guidelines.



#### Create

Create a proposal in the form of a scale drawing for the locations of several new features in Sioux Strip State Wildlife Management Area. Include explanations as to why and where these features should be added.



#### **Evaluate**

When your proposal is complete, swap proposals with another student. Use the park management guidelines to determine whether the proposal is valid.



#### Present

Valid proposals will be presented to the class and then voted on to determine the best proposal.

Chapter 5 Project

The Great Outdoors

#### **Chapter Project**

Students use 21st century research skills and what they have learned in the chapter to complete a Chapter Project.

### **Park Management Guidelines**

#### Attach these guidelines to your proposal.

1.	Provide a brief description of a park close to your community. Analyze the types of features available at the park and the locations of these features within the park.	
	<ul><li>3 pts: Description is provided and complete.</li><li>0 pt: Description is not provided.</li></ul>	/ 3
2.	Provide or create a scale map of the Sioux State Strip Wildlife Management Area. Include the scale on the map.	
	<ul><li>3 pts: Scale map is provided and complete.</li><li>0 pt: Scale map is not provided.</li></ul>	/ 3
3.	On your scale map, locate the circumcenter of the management area. Mark the point with a red dot. Explain your construction.	
	8 pts: Circumcenter is correctly placed and explanation is complete. -2 pts: for each error	/ 8
4.	On your scale map, locate the incenter of the management area. Mark the point with a blue dot. Explain your construction.	
	8 pts: Incenter is correctly placed and explanation is complete. -2 pts: for each error	/ 8
5.	On your scale map, locate the centroid of the management area. Mark the point with a green dot. Explain your construction.	
	8 pts: Centroid is correctly placed and explanation is complete. -2 pts: for each error	/ 8
6.	On your scale map, locate the orthocenter of the management area. Mark the point with a purple dot. Explain your construction.	
	8 pts: Orthocenter is correctly placed and explanation is complete. -2 pts: for each error	/ 8
7.	In a proposal, recommend features to place at the circumcenter, incenter, centroid, and orthocenter of your scale map. Label each one on your map. Include your reasoning for why the feature should be added and placed at this location. Examples of features include:	
	<ul> <li>information center</li> <li>picnic area</li> <li>water fountain</li> <li>restrooms</li> <li>playground</li> <li>basketball court</li> <li>soccer field</li> <li>pavilion</li> </ul>	
	<ul> <li>3 pts: Feature is placed at location, labeled, and an explanation as to why the feature should be placed at this location is provided.</li> <li>-1 pt: for each omitted component</li> </ul>	/ 12
	Total Points	/ 50

Chapter 5 Rubric

The Great Outdoors

**Chapter Project** 

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### What Do You Think?



#### **Creativity and Innovation**

- 1. After viewing the proposals, what impressed you? Explain.
- 2. Are there any aspects of your proposal that you would change or modify? Explain.



#### **Environmental Literacy**

- 3. What are some of the job functions of park managers? What education is required?
- 4. What personality traits and/or interests do you think would be beneficial to a park manager?
- 5. What factors do you think would limit the number and type of features that a park manager could implement in his or her management area?
- 6. How is the location of a feature within a park determined?



#### Critical Thinking

- 7. How do park managers use math in their jobs?
- 8. Would it be possible to place a feature at each point of concurrency for any triangular park? Explain your reasoning.

**Chapter 5 Reflection** 

The Great Outdoors

**Chapter Project** 

#### Similarity 3: Proportions



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#### Graphic Novels

Graphic Novels provide real-world problem-solving situations in a graphic novel format.

## **Lesson-Level Resources**

### Lead Every Lesson

Every day, every class, every student is a little different. Be ready for every day challenges with resources built into the *Oklahoma Glencoe High School Math Series* to help stay in front of these challenges.

Keep these resources at your fingertips for quick and easy adjustments.

- Oklahoma Interactive Student Guide: With focus on Oklahoma Academic Standards for Mathematics, this resource takes students deeper into the content in a format that prepares them for next generation assessments.
- **Personal Tutors:** Step-by-step solutions to sample problems for students to review and practice key concepts.
- **5-Minute Check Transparencies:** Lesson summaries with questions from standardized tests. Use to measure understanding of concepts.
- Editable Worksheets: Practice opportunities. Use to help students skill development, intervention, and enrichment.
- Animations: Motion graphics explaining key concepts. Review to engage visual learners more deeply in chapter content.
- Calculator Activities: Expand concepts to supplement your lesson planning.

All of these resources help students gain confidence, mathematical and real-world knowledge as they learn critical thinking skills.





Chapter 5

Geometry

#### 5-Minute Check

Used as warm-up activities at the beginning of the class period, or as a quiz or end-of-lesson check to monitor students' understanding.

Relationships in Triangles	Glencoe McGraw-Hill
Activity	0 8 9
	A
Construct bisectors of angles A, B and C. Click A, B, or C	
to select an angle. Once the angle appears drag it to	4
construct a disector for that angle.	/30°
A B C	
Check Answer	
Close this feedback pop-	
up to proceed further.	600 900
	B
	~ ~
	3/4



Animations and BrainPOP<sup>®</sup> Videos Animations are demonstrations of selected Key Concepts and topics from your textbook.

#### LESSON LEVEL RESOURCES



#### Personal Tutors

The Glencoe Personal Tutor Plus presents a teacher explaining a step-by-step solution to a problem like one presented in the lesson, PLUS an online activity to check your understanding.

#### **LESSON LEVEL RESOURCES**



Study Notebook

The Study Notebook helps students organize their notes for understanding and quick retrieval of information.

#### **LESSON LEVEL RESOURCES**

	Details
The Triangle Inequality pp. 360–361	If the measures of two sides of a triangle are 4 centimeters and 9 centimeters, what is the <i>le</i> possible whole number measure for the third s
	inequalities for a triangle with sides 4, 9, and x centimeters.
	<b>Step 2:</b> Solve each the inequalities.
	<b>Step 3:</b> Use the inequalities to solve the problem
<b>Proofs Using the</b> <b>Triangle Inequality</b> p. 362	Complete the two-column proof. F Given: $\overline{FI} \cong \overline{FJ}$ Prove: $FI + FH > HJ$
	Statements Reasons
	3.     3.       4.     4.
Helping You Ren	A good way to remember a new theorem is forent words. How could you restate the Triangle Inequali
state it informany in un	lefent words. How could you restate the Thangle mequan
Theorem?	
Theorem?	
Theorem?	
#### NAME \_\_\_\_

# **5-5 Study Guide and Intervention** *The Triangle Inequality*

**The Triangle Inequality** If you take three straws of lengths 8 inches, 5 inches, and 1 inch and try to make a triangle with them, you will find that it is not possible. This illustrates the Triangle Inequality Theorem.

Triangle Inequality	The sum of the lengths of any two sides of a triangle must be greater than the length of the third side.	$C \xrightarrow{b} A c$
Theorem		a + b > c
		b + c > a
		a + c > b

Example : The measures of two sides of a triangle are 5 and 8. Find a range for the length of the third side.

By the Triangle Inequality Theorem, all three of the following inequalities must be true.

5 + x > 8	8 + x > 5	5 + 8 > x
x > 3	x > -3	13 > x

Therefore *x* must be between 3 and 13.

#### Exercises

Is it possible to form a triangle with the given side lengths? If not, explain why not.

1. 3, 4, 6	<b>2.</b> 6, 9, 15
3. 8, 8, 8	<b>4.</b> 2, 4, 5
5. 4, 8, 16	<b>6.</b> 1.5, 2.5, 3

#### Find the range for the measure of the third side of a triangle given the measures of two sides.

7. 1 cm and 6 cm	<b>8.</b> 12 yd and 18 yd	
0 15 0 15 5 0	<b>10</b> 92 m and 9 m	
$\mathbf{y}_{i}$ is and solution	10.82 m and 8 m	

**11.** Suppose you have three different positive numbers arranged in order from least to greatest. What single comparison will let you see if the numbers can be the lengths of the sides of a triangle?

Chapter 5

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Glencoe Geometry

Study Guide and Intervention The Study Guide and Intervention Worksheet help the student preview the concepts and practice the skills of the lesson.

**LESSON LEVEL RESOURCES** 

# **5-5 Study Guide and Intervention** (continued) The Triangle Inequality

Proofs Using The Triangle Inequality Theorem You can use the Triangle Inequality Theorem as a reason in proofs.

Complete the following proof.

**Given**:  $\triangle ABC \cong \triangle DEC$ **Prove**: AB + DE > AD - BE**Proof**:

NAME \_\_\_\_

	A
Statements	Reasons
<b>1.</b> $\triangle ABC \cong \triangle DEC$	1. Given
<b>2.</b> $AB + BC > AC$	<b>2.</b> Triangle Inequality Theorem
DE + EC > CD	
<b>3.</b> $AB > AC - BC$	<b>3.</b> Subtraction
DE > CD - EC	4. Addition
4.AB + DE > AC - BC + CD - EC	
<b>5.</b> $AB + DE > AC + CD - BC - EC$	5. Commutative
6. AB + DE > AC + CD - (BC + EC)	6. Distributive
7. AC + CD = AD	7. Segment Addition Postulate
BC + EC = BE	
8. AB + DE > AD - BE	8. Substitution

#### Exercises

PROOF Write a two column proof.

Given:  $\overline{PL} \parallel \overline{MT}$ 

K is the midpoint of  $\overline{PT}$ .

**Prove:** PK + KM > PL

## **Proof:**

Statements	Reasons
<b>1.</b> $\overline{PL} \parallel \overline{MT}$	1
<b>2.</b> $\Box P \cong \Box T$	2
<b>3.</b> <i>K</i> is the midpoint of $\overline{PT}$	3. Given
<b>4.</b> $PK = KT$	4
5	5. Vertical Angles Theorem
<b>6.</b> $\triangle PKL \cong \triangle TKM$	6
7	7. Triangle Inequality Theorem
8	8. CPCTC
<b>9.</b> $PK + KM > PL$	9

Chapter 4

Study Guide and Intervention





Glencoe Geometry

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В

# **5-5 Skills Practice** The Triangle Inequality

Is it possible to form a triangle with the given side lengths? If not, explain why not.

<b>1.</b> 2 ft, 3 ft, 4 ft	<b>2.</b> 5 m, 7 m, 9 m
<b>3.</b> 4 mm, 8 mm, 11 mm	<b>4.</b> 13 in., 13 in., 26 in.
<b>5.</b> 9 cm, 10 cm, 20 cm	<b>6.</b> 15 km, 17 km, 19 km
<b>7.</b> 14 yd, 17 yd, 31 yd	<b>8.</b> 6 m, 7 m, 12 m

Find the range for the measure of the third side of a triangle given the measures of two sides.

<b>9.</b> 5 ft, 9 ft	<b>10.</b> 7 in., 14 in.
<b>11.</b> 8 m, 13 m	<b>12.</b> 10 mm, 12 mm
<b>13.</b> 12 yd, 15 yd	<b>14.</b> 15 km, 27 km
<b>15.</b> 17 cm, 28 cm,	<b>16.</b> 18 ft, 22 ft

<b>17. Proof</b> Complete the proof.	A
<b>Given:</b> $\triangle BC$ and $\triangle CDE$	BC
<b>Prove:</b> $AB + BC + CD + DE > AE$	D

**Proof:** 



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#### **Skills Practice**

Skills Practice Masters provide students with additional practice in the skills taught in each lesson.

# 5-5 Practice The Triangle Inequality

NAME \_\_\_\_

Is it possible to form a triangle with the given side lengths? If not explain why not.

1. 9, 12, 18	<b>2.</b> 8, 9, 17
<b>3.</b> 14, 14, 19	<b>4.</b> 23, 26, 50
<b>5.</b> 32, 41, 63	<b>6.</b> 2.7, 3.1, 4.3
7.0.7, 1.4, 2.1	<b>8.</b> 12.3, 13.9, 25.2

### Find the range for the measure of the third side of a triangle given the measures of two sides.

<b>9.</b> 6 ft and 19 ft	<b>10.</b> 7 km and 29 km
<b>11.</b> 13 in. and 27 in.	<b>12.</b> 18 ft and 23 ft
<b>13.</b> 25 yd and 38 yd	<b>14.</b> 31 cm and 39 cm
<b>15.</b> 42 m and 6 m	<b>16.</b> 54 in. and 7 in.

**17. Given:** *H* is the centroid of  $\triangle EDF$ . **Prove:** EY + FY > DEReasons Statements **1.** *H* is the centroid of  $\triangle EDF$ . 1. Given 2. **2.**  $\overline{EY}$  is a median. 3.\_\_\_\_\_ **3.** Definition of median 4.\_\_\_\_\_ 4. Definition of midpoint 5.\_\_\_\_\_ **5.** EY + DY > DE6.\_\_\_\_\_ **6.** EY + FY > DE

18. GARDENING Ha Poong has 4 lengths of wood from which he plans to make a border for a triangular-shaped herb garden. The lengths of the wood borders are 8 inches, 10 inches, 12 inches, and 18 inches. How many different triangular borders can Ha Poong make?

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#### Practice

The Practice Worksheet helps students practice the skills in the lesson and use those skills to solve problems.

# 5-5 Word Problem Practice The Triangle Inequality

**1. STICKS** Jamila has 5 sticks of lengths 2, 4, 6, 8, and 10 inches. Using three sticks at a time as the sides of triangles, how many triangles can she make?

**3. PATHS** While out walking one day Tanya finds a third place to cross the railroad tracks. Show that the path through point *C* is longer than the path through

- Use the figure at the right for Exercises 2 and 3.
- 2. PATHS To get to the nearest super market, Tanya must walk over a railroad track. There are two places where she can cross the track (points A and B). Which path is longer? Explain.



- **4. CITIES** The distance between New York City and Boston is 187 miles and the distance between New York City and Hartford is 97 miles. Hartford, Boston, and New York City form a triangle on a map. What must the distance between Boston and Hartford be greater than?
- **5. TRIANGLES** The figure shows an equilateral triangle *ABC* and a point *P* outside the triangle.



- **a.** Draw the figure that is the result of turning the original figure 60° counterclockwise about *A*. Denote by *P*', the image of *P* under this turn.
- **b.** Note that  $\overline{P'B}$  is congruent to  $\overline{PC}$ . It is also true that  $\overline{PP'}$  is congruent to  $\overline{PA}$ . Why?
- **c.** Show that  $\overline{PA}$ ,  $\overline{PB}$ , and  $\overline{PC}$  satisfy the triangle inequalities.

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point B.

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#### Word Problems

Word Problem Practice provides additional practice in solving word problems that apply the concepts of the lesson.

# **5-5 Enrichment Constructing Triangles**

NAME

The measurements of the sides of a triangle are given. If a triangle having sides with these measurements is not possible, then write *impossible*. If a triangle is possible, draw it and measure each angle with a protractor.

$\mathbf{I.} AR = 5 \text{ cm}$	$m \angle A =$	<b>2.</b> $PI = 8 \text{ cm}$	$m \angle P =$
RT = 3  cm	$m \angle R =$	IN = 3  cm	$m \angle I =$
AT = 6  cm	$m \angle T =$	PN = 2  cm	$m \angle N =$

<b>3.</b> $ON = 10 \text{ cm}$	$m \angle O =$	<b>4.</b> $TW = 6 \text{ cm}$	$m \angle T =$
NE = 5.3 cm	$m \angle N =$	WO = 7  cm	$m \angle W =$
OE = 4.6  cm	$m \angle E =$	TO = 2  cm	$m \angle O =$

<b>5.</b> $BA = 3.1 \text{ cm}$	$m \angle B =$	<b>6.</b> $AR = 4 \text{ cm}$	$m \angle A =$
AT = 8  cm	$m \angle A =$	RM = 5  cm	$m \angle R =$
BT = 5  cm	$m \angle T =$	AM = 3  cm	$m \angle M =$

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Enrichment

Enrichment Masters provide students with valuable opportunities for extending the lessons.

# **5-3 Graphing Calculator Activity** *Cabri Junior: Inequalities in One Triangle*

Cabri Junior can be used to investigate the relationships between angles and sides of a triangle. **Step 1** Use Cabri Junior, to draw and label a triangle.

- Select **F2 Triangle** to draw a triangle.
- Move the cursor to where you want the first vertex. Press ENTER
- Repeat this procedure to determine the next two vertices of the triangle.
- Select F5 Alph-num to label each vertex.
- Move the cursor to a vertex, press ENTER, enter A, and press ENTER again.
- Repeat this procedure to label vertex B and vertex C.
- **Step 2** Draw an exterior angle of  $\triangle ABC$ .
  - Select F2 Line to draw a line through  $\overline{BC}$ .
  - Select F2 Point, Point on to draw a point on  $\overrightarrow{BC}$  so that C is between B and the new point.
  - Select F5 Alph-num to label the point D.
- **Step 3** Find the measures of the three interior angles and the exterior angle,  $\angle ACD$ .
  - Select F5 Measure, Angle.
  - To find the measure of  $\angle ABC$ , select points A, B, and C (with the vertex B as the second point selected).
  - Repeat to find the remaining angle measures.
- **Step 4** Find the measure of each side of  $\triangle ABC$ .
  - Select F5 Measure, D. & Length.
  - To find the length of  $\overline{AB}$ , select point A and then select point B.
  - Repeat this procedure to find the lengths of  $\overline{BC}$  and  $\overline{CA}$ .

#### Exercises

#### Analyze your drawing.

- **1.** What is the relationship between  $m \angle ACD$  and  $m \angle ABC$ ?  $m \angle ACD$  and  $m \angle BAC$ ?
- 2. Make a conjecture about the relationship between the measures of an exterior angle ( $\angle ACD$ ) and its two remote interior angles ( $\angle ABC$  and  $\angle BAC$ ).
- **3.** Change the dimensions of the triangle by moving point *A*. (Press CLEAR so the pointer becomes a black arrow. Move the pointer close to point *A* until the arrow becomes transparent and point *A* is blinking. Press ALPHA to change the arrow to a hand. Then move the point.) Is your conjecture still true?
- **4.** Which side of the triangle is the longest? the shortest?
- 5. Which angle measure (not including the exterior angle) is the greatest? the least?
- **6.** Make a conjecture about where the longest side is in relationship to the greatest angle and where the shortest side is in relationship to the least angle.

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Glencoe Geometry

Graphic Calculator Activities Graphing Calculator Activities present ways in which technology can be used with the concepts in some lessons.

#### 4.7 55.8 6.0 104.9 75.1 5.1 8

Self-Check Quizzes

Lesson 5-5 The Triangle Inequality

1. Is it possible to draw a triangle with sides measuring 13, 21, and 39? Explain

- ○A. Yes; 13 + 21 is less than 39.
- $\bigcirc$  B. No; 39 is greater than 13 + 21.
- OC. Yes; the sides of the triangle are not all the same lengths.
- ○D. No; 13 is less than 21 + 39.

<u>Hint</u>

2. Which of the following could not be a triangle?

⊖A.	7, 28, 22	⊙В.	15, 18, 8
⊖C.	7, 11, 3	⊖D.	9, 9, 9
Hint			

3. If 28 and 49 are the lengths of two sides of a triangle, between what two numbers must the measure of the third side fall?

⊖A.	31 and 67	⊖В.	21 and 77
⊖C.	28 and 49	⊖D.	10 and 60
<u>Hint</u>			

4. Is it possible to draw a triangle with sides measuring 32, 96, and 118? Explain.

- $\bigcirc$  A. Yes; 96 is between 32 and 118.
- ○B. No; 32 is less than 96 + 118.
- ○C. No; 32 + 96 is less than 118.

D. Yes; the sum of the measures of any two sides is greater than the other side measure.

<u>Hint</u>

5. The state capitals of Santa Fe, Oklahoma City, and Austin are shown in the map below. Abbreviating the cities by their first letter, write a mathematical statement using the Triangle Inequality Theorem to prove the distance from Santa Fe to Austin to Oklahoma City is greater than the distance from Santa Fe to Oklahoma City.



### Self-Check Quizzes

Self-Check Quizzes help students review concepts from each lesson.



Interactive Classroom includes the 5-Minute Check questions; fully worked-out, step-by-step examples; and Check Your Progress problems in an editable PowerPoint format to use for classroom presentation on your whiteboard.

## Objectives

- Develop and understand the definition of rotations.
- Draw the image of a given figure under a rotation.
- Specify the rotation that maps one figure to another.

## **EXAMPLE 1** Develop the Definition of Rotations

**EXPLORE** Use geometry software, as follows, to explore rotations. As you do so, think about how you could use angles and distances to define a rotation about a point.

**a. USE TOOLS** Use geometry software to draw a triangle and a point. Label these as  $\triangle ABC$  and point *P*, as shown below on the left.



- **b. USE TOOLS** Use the software to draw the image of  $\triangle ABC$  after a counterclockwise rotation of 100° around point *P*. Label the image  $\triangle A^{\prime}B^{\prime}C^{\prime}$ , as shown above on the right.
- c. USE TOOLS Use the software to measure the distance from A to P and the distance from A' to P. What do you notice? Change the shape or location of  $\triangle ABC$ . Does this relationship remain the same?
- **d. USE TOOLS** Use the software to measure  $\angle APA^2$ ,  $\angle BPB^2$ , and  $\angle CPC^2$ . Change the shape or location of  $\triangle ABC$ . What do you notice?

e. MAKE A CONJECTURE What can you conclude about the distances and angle measures in  $\triangle ABC$  and  $\triangle A'B'C'$ ? Use the software to check your conjecture.



**CHAPTER1** Congruence Transformations

#### **Oklahoma Interactive Student Guide**

Provides students practice and focus on Oklahoma Academic Standards for Mathematics within each lesson. Students are presented with multiple opportunities for higher-order thinking and conceptual understanding.

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A **rotation** about a fixed point, *P*, called the **center** of **rotation**, through an angle of  $x^\circ$ , is a function that maps a point to its image as follows.

- If the point is the center of rotation, then the image and preimage are the same point.
- If the point is not the center of rotation, then the image and preimage are the same distance from the center of rotation, and the measure of the angle formed by the preimage, the center of rotation, and the image is x.

In the above definition, the **angle of rotation** is x°. Unless otherwise stated, you can assume all rotations are counterclockwise.

# EXAMPLE 2 Draw a Rotation

Work directly on the figure below and follow the given steps to draw the image of  $\Delta JKL$  after a 160° rotation about point Q.

- **a. USE TOOLS** Use a straightedge to draw  $\overline{JQ}$ .
- **b. USE TOOLS** Use a protractor to draw a ray that forms a  $160^{\circ}$  angle with  $\overline{JQ}$ .
- **c. USE TOOLS** Use a ruler to mark a point J' on the ray so that J'Q = JQ.
- d. USE TOOLS Repeat steps a-c to locate points K' and L'. Then use a straightedge to draw ∠J'K'L'.
- e. CHECK REASONABLENESS How can you use a piece of tracing paper to check that your drawing is reasonable?



**Oklahoma Interactive Student Guide** 

1.6 Rotations 5

Like other transformations, a rotation is a function that takes points of the plane as inputs and gives other points of the plane as outputs. When you perform rotations on a coordinate plane, you can use algebraic rules to specify how a point is mapped to its image.

# **Key Concept:**

Complete the table by writing the rule for each rotation. The first one has been done for you.

Rotation	Algebraic Rule
90° about the origin	$(x, y) \rightarrow (-y, x)$
180° about the origin	
270° about the origin	

## EXAMPLE 3 Draw a Rotation

Follow these steps to draw the image of quadrilateral *ABCD* after a rotation of 180° about the origin.

**a. ANALYZE RELATIONSHIPS** Predict the effect of the rotation on quadrilateral *ABCD* before drawing the image.



- **b. ANALYZE RELATIONSHIPS** Complete the table to find the image of each vertex of quadrilateral *ABCD*.
- **c. USE TOOLS** Use the table to help you draw the image of quadrilateral *ABCD* on the coordinate plane above.
- **d. CRITIQUE REASONING** A student said that another way to map quadrilateral *ABCD* to its final image is by first rotating it 90° about the origin and then rotating the image 90° about the origin. Do you agree? Use the algebraic rules to support your answer.

Preimage ( <i>x, y</i> )	Image (- <i>x</i> , - <i>y</i> )
A(2, -1)	A´(-2, 1)

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6 CHAPTER 1 Congruence Transformations

**Oklahoma Interactive Student Guide** 

# **Assessment Resources**

# Learn with Every Assessment

Assessments are the key to helping you determine where each student is academically to establish a path to move each student where they need to be.

You'll have assessment options including multiple choice, open ended questions, and assessments that are designed to mirror state tests.

Immediately following each chapter segment are quizzes and vocabulary tests to help you evaluate students' understanding of concepts presented in that segment.

**Extended Response** tests and standardized test practice encourage students to use their critical thinking skills as they prepare for state assessments.



# GEOMETRY

Hello Jack Ashton | My Profile | Sharing Center | Help

Section: Test Generator

Quantilar Only	E E The Television (Benetice)	
Question Sets So Options	5-5 The Triangle Inequality (Practice)	X
∰ My Question Sets	File Edit Test Question	
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H. DAlgebra 1	Indicate the answer choice that best completes the statement or answers the question	
E Geometry	indicate the answer choice that best completes the statement of answers the question.	- 1
	Is it possible to form a triangle with the given side lengths? If not explain why not.	- 1
Math Connects 2012, Course 1	1. 9, 12, 18	- 1
Math Connects 2012, Course 2		- 1
⊕ f Precalculus	a. yes	- 1
	b. no; 9 + 12 >18	- 1
	c. no; 18 + 9 > 12	- 1
	d. no; 18 + 12 > 9	
	ANSWER: a	- 1
	2. 8, 9, 17	- 1
	a ves	- 1
	a. yes b. no: $8 + 9 = 17$	- 1
	c. no; 9 + 17 > 8	
	d no: 17 + 8 > 9	
	u. no, 17 + 0 × 9	
	ANSWER: b	
	3 14 14 19	
	5. 17, 17, 19	- 1
	a. yes	- 1
	b. no; $14 + 14 > 19$	
	c. no; 14 + 19 > 14	- 1
	d. no; two sides have the same length	
		- 1
	ANSWER: a	- 1
Tests 🐵 Options 🗸	4. 23, 26, 50	- 1
⊞ d My Tests		- 1
E Shared Content	a. yes $h_{\rm res} = 22 \pm 26 \le 50$	- 1
E. d Algebra 1	0. no; 25 + 26 < 50	
🕀 👘 Algebra 2	c. $10; 20 + 30 > 23$	- 1
🖃 🍯 Geometry	d. no; $50 + 23 > 26$	- 1
Assessment Items, Technology Enhanced	ANSWER: b	- 1
🗈 🍯 Chapter 0 Preparing for Geometry	5 33 41 63	- 1
E. Chapter 1 Tools of Geometry	5. 32, 41, 63	
E. Chapter 2 Reasoning and Proof	a, ves	- 1
🗄 🎁 🎼 🎼 Chapter 3 Parallel and Perpendicular Lines	b. no: $32 \pm 41 > 63$	- 1
Ghapter 4 Congruent Triangles     Ghapter 4 Congruent     Ghapter 4 Congruent     Ghapter 4 Congruen	c. no: $41 + 63 > 32$	
🖕 🂋 Chapter 5 Relationships in Triangles	d. no: $63 + 32 > 41$	
5-1 Bisectors of Triangles (Practice)		
	ANSWER: a	
5-3 Inequalities in One Triangle (Practice)	6, 2, 7, 3, 1, 4, 3	
5-4 Indirect Proof (Practice)		
5-5 The Triangle Inequality (Practice)	a. yes	
5-6 Inequalities in Two Triangles (Practice)	b. no; 2.7 + 3.1 > 4.3	
Ext. Hesponse (Chapter Resource Mast	c. no; 4.3 + 2.7 > 3.1	
E Form 2A (Chapter Resource Masters)	d. no; 3.1 + 4.3 > 2.7	
Form 2B (Chapter Resource Masters)	ANSWED a	
Form 2C (Chapter Resource Masters)	ANDWER: 8	
Form 2D (Chapter Resource Masters)	7. 0.7, 1.4, 2.1	
Form 3 (Chapter Resource Masters)		
Mid-Chapter Test (Chapter Resource Ma	a. yes	
Quiz 1 (Chapter Resource Masters)	b. no; 0.7 + 2.1 > 1.4	
Quiz 2 (Chapter Resource Masters)	c. no; 2.1 + 1.4 > 0.7	
Quiz 3 (Chapter Resource Masters)	d. no; 0.7 + 1.4 = 2.1	

#### eAssessment

A complete test building program with unique banks, as well as banks of the traditional assessments.

# **Proficiency Chart**

Proficiency Level: 70% School: Messina High School

Learning Objective	# of Items	# of Students	# Times Asked	Performance 0% 50% 100%	Student Average	% of Students Proficient
2(Å) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section	5	13	109		69.7%	53.9%
2(B) know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories	7	13	115		69.2%	61.5%
2(C) know scientific theories are based on natural and physical phenomena and are capable of being texted by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explana- tions, but they may be subject to change as new areas of science and new technologies are developed	4	10	200		64.5%	30.0%
2(D) distinguish between scientific hypotheses and scientific theories	8	21	397		67.2%	61.9%
Collect and record data using the international System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers	4	1	4		75.0%	100%

Progress Chart Instructor: Megan Johnson School: Messina High School Term: All Proficiency Levels: 0 0% - 64%	⊖ 65% - 84	% ● 85%	6 - 100%					
Standards	# Iter	ns Eva Smith	n Gary Holmes	Laura Langston	Paul Mcallister	Matthew Medina	Donna Puryear	Laura Jacobs
(3.A) determine the slope of a line given a table of vative points on the line, and an equation written in vationcluding $y = mx + b$ , $Ax + By = C$ , and $y - y1 = m(x - x)$	alues, a graph, 16 rious forms, :1);	$\Theta$	•	0	Ð	•	•	0
(3.8) calculate the rate of change of a linear function tabularly, graphically, or algebraically in context of m and real-world problems;	represented athematical 22		igodol	θ	$\Theta$	$\Theta$	θ	•
(3.C) graph linear functions on the coordinate plane key features, including x-intercept, y-intercept, zeros, mathematical and real-world problems;	and identify , and slope, in 9	$\Theta$	•	0	$\Theta$	•	•	•
(3.D) graph the solution set of linear inequalities in t on the coordinate plane;	wo variables 10	$\Theta$	•	0	•	$\Theta$	$\Theta$	$\Theta$
(3.E) determine the effects on the graph of the parer $f(x) = x$ when $f(x)$ is replaced by $af(x)$ , $f(x) + d$ , $f(x - c)$ , $f(x) = x$ specific values of a, b, c, and d;	nt function 7 (bx) for 7	•	e	$\Theta$	$\Theta$	$\Theta$	igodol	•
(3.F) graph systems of two linear equations in two va the coordinate plane and determine the solutions if	ariables on 8 they exist;	$\Theta$	•	0	•	$\Theta$	$\Theta$	$\Theta$
(3.G) estimate graphically the solutions to systems o equations with two variables in real-world problems;	f two linear 32 and 32		$\Theta$	$\Theta$	$\Theta$	$\Theta$	$\Theta$	•
(3.H) graph the solution set of systems of two linear two variables on the coordinate plane.	inequalities in 60	•	٠	0	•	e	θ	θ

eAssessment Reports Multiple reports are available to analyze student performance.

NAME	DATE	PERIOD
Chapter 5 Quiz 1 (Lessons 5-1 through 5-2)		SCORE
1. What is the point called where the per- triangle intersect?	pendicular bisectors of the sides of a $x$	1
<b>2.</b> In $\triangle XYZ$ , point <i>M</i> is the centroid. If $XM = 8$ , find the length of $\overline{MA}$ .	y A Z	2
<b>3.</b> What is the name of the point that is two triangle to the midpoint of the opposit	vo-thirds of the way from each vertex e side?	of a3
For Questions 4 and 5, use quadrilatera perpendicular bisector of $\overline{AB}$ , and $\overline{AB}$	al <i>ABCD</i> given that $\overline{CD}$ is the is the perpendicular bisector of $\overline{CD}$ .	
<b>4.</b> Find the value of <i>y</i> .	x + 1 x + 1 x + 7 x + 7 x + 7 x + 7	4
<b>5.</b> Find the value of $x$ .	2y-3	5
(Lessons 5-3) 1. Determine which angle has the greates	st measure. $2$	SCORE
For Questions 2 and 3, use quadrilatera	PQRS.	
<b>2.</b> Find the shortest segment in $\triangle PQS$ .	Q 61° 54° 51° R	2
<b>3.</b> Find the longest segment $\triangle QRS$ .	P <u>63°56°</u> 55° S	3
For Questions 4 and 5, use quadrilatera	11 UVWX.	
<b>4.</b> Find the angle with the smallest measured the smallest measured by	are in $\triangle VUW$ .	4
<b>5.</b> Find the angle with the greatest measu	V = 5 W re in $\Delta UWX$ .	5
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Free-response quizzes offer assessment at appropriate intervals in the chapter.

NAME		DATE	PERIOD
Chapter 5 Q (Lessons 5-4 through 5-	<b>uiz 3</b>		SCORE
1. What do you assume in	n an indirect proof?		1
For Questions 2 and 3, w indirect proof of each sta	rite the assumption you wo Itement.	uld make to start an	
<b>2.</b> If $2x + 7 = 19$ , then $x =$	- 6.		2
<b>3.</b> If $\triangle ABC$ is isosceles w	th base $\overline{AC}$ , then $\overline{AB} \cong \overline{BC}$		3
<b>4.</b> Write an inequality to	describe the possible values of	of x. $x = \sqrt{7}$	4
5. MULTIPLE CHOIC lengths of the sides of	E Which of the following sets a triangle?	9 s of numbers can be the	
<b>A</b> 5, 5, 10 <b>B</b> $\sqrt{3}$	$\overline{89}, \sqrt{8}, \sqrt{5}$ C 2.5, 3.4,	4.6 <b>D</b> 1, 2, 4	5
Chapter 5 Q (Lessons 5-6)	uiz 4		SCORE
<b>1.</b> Write an inequality relating $m \angle 1$ to $m \angle 2$ .	2. Wri rela	te an inequality relating $AB$ to $DE$	g 1.
5 6 1 2	A	$\begin{array}{c} C \\ 9 \\ 72^{\circ} \\ B \\ D \end{array} \begin{array}{c} F \\ 9 \\ 75^{\circ} \\ F \\ 9 \\ 75^{\circ} \\ F \\ 9 \\ 75^{\circ} \\ F \\ F \\ 9 \\ 75^{\circ} \\ F \\ F \\ 75^{\circ} \\ F \\ F \\ 9 \\ 75^{\circ} \\ F \\ $	2
<b>3.</b> Write an inequality abo	but the length of $\overline{GH}$ .	6 60° 9 7 60° 9 60°	3
For Questions 4 and 5, co for each corresponding lo	omplete the proof by supply ocation.	ring the missing inform	nation
<b>Given:</b> $AB = DE$ , and $BE = DE$ .	> AD C <		
Statements	Reasons	_	
<b>1.</b> AB = DE, BE > AD	1. Given		
<b>2.</b> $\overline{AB} \cong \overline{DE}$	<b>2.</b> Def. of $\cong$ segments		4
3. (Question 4)	<b>3.</b> Reflexive Prop.		7
$4. m \angle CAE > m \angle CEA$	4. <u>(Question 5)</u>		5
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Chapter Quizzes

Assessment



## **Mid-Chapter Test**

The Mid-Chapter Test provides an option to assess the first half of the chapter. It includes both multiple-choice and free-response questions.

5

DATE \_

|--|

SCORE \_\_\_\_

# **Chapter 5 Vocabulary Test**

altitude	incenter
centroid	indirect
circumcenter	indirect
concurrent lines	median

indirect proof indirect reasoning median orthocenter perpendicular bisector point of concurrency proof by contradiction

# Write whether each sentence is *true* or *false*. If false, replace the underlined word or number to make a true sentence.

- 1. The <u>altitude</u> of a triangle is a segment whose endpoints are a vertex of a triangle and the midpoint of the side opposite the vertex.
- **2.** The <u>centroid</u> of a triangle is the point where the altitudes of the triangle intersect.

## Choose the correct term to complete each sentence.

- **3.** The point of concurrency of the perpendicular bisectors of a triangle is called the (*circumcenter*, *median*).
- **4.** The *(incenter, orthocenter)* of a triangle is the intersection of the angle bisectors of the triangle.
- **5.** The sum of the measures of any two sides of a triangle is (*greater*, *less*) than the measure of the third side.

## Choose from the terms above to complete each sentence.

- **6.** A(n) \_\_\_\_\_\_ is a segment that joins a vertex of a triangle and is perpendicular to the side opposite to the vertex.
- 7. Proof by contradiction is a type of \_\_\_\_\_\_.
- 8. The \_\_\_\_\_\_ of a triangle is equidistant from the vertices of the triangle.

## Define each term in your own words.

**9.** concurrent lines

10. median

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Chapter 5

48

Glencoe Geometry

#### Vocabulary Test

The Vocabulary Test includes a list of vocabulary words and questions to assess students' knowledge of the words used in the chapter.

NAME \_\_\_\_\_\_ DATE \_\_\_\_\_ PERIOD \_\_\_\_\_

Chapter 5 Test, Form	n 1		SCORE
Write the letter for the correct answer in the For Questions 1-4, refer to the figure at the	<i>blank at the righ</i> right.	t of each question.	
	$\begin{array}{c} \mathbf{C}  \overrightarrow{GB} \\ \mathbf{D}  \overrightarrow{CF} \\ \end{array}$		1
2. Name a perpendicular bisector. <b>F</b> $\overline{DE}$ <b>G</b> $\overline{AB}$	$\mathbf{H} \overleftarrow{GB}$	↓ J <i>CF</i>	2
<b>3.</b> Name an angle bisector. <b>A</b> $\overline{DE}$ <b>B</b> $\overline{AB}$	$\mathbf{C} \overleftarrow{GB}$	$\mathbf{D} \ \overrightarrow{CF}$	3
<b>4.</b> Name a median. $\mathbf{F} \ \overline{DE}$ $\mathbf{G} \ \overline{AB}$	$\mathbf{H} \overleftarrow{GB}$	J $\overrightarrow{CF}$	4
For Questions 5-7, refer to the figure to det which is a true statement for the given info	termine rmation.	B C C	
5. $\overline{AC}$ is a median. A $m \angle ACD = 90$ B $\angle BAC \cong \angle DAC$	$\mathbf{C} \ BC = CD$ $\mathbf{D} \ \angle B \cong \angle D$		5
6. $\overline{AC}$ is an angle bisector. F $m \angle ACD = 90$ G $\angle BAC \cong \angle DAC$	<b>H</b> $BC = CD$	$\mathbf{J} \angle B \cong \angle D$	6
7. $\overline{AC}$ is an altitude. <b>A</b> $m \angle ACD = 90$ <b>B</b> $\angle BAC \cong \angle DAC$	$\mathbf{C} BC = CD$	$\mathbf{D} \angle B \cong \angle D$	7
8. Name the longest side of $\triangle DEF$ . <b>F</b> $\overline{DE}$ <b>G</b> $\overline{EF}$	$\mathbf{H} \ \overline{DF} \qquad \mathbf{J} \ \mathbf{C}$	$E \xrightarrow{108^{\circ}} 10^{\circ}$	8
<ul> <li>9. Which angle in △ABC has the greatest me</li> <li>A ∠A</li> <li>B ∠B</li> </ul>	asure? C ∠C D cannot tell	$A \xrightarrow{\frac{B}{9}} C$	9
<ul><li>10. Which theorem compares two sides and the F Hinge Theorem</li><li>G Converse of the Hinge Theorem</li><li>H Exterior Angle Inequality Theorem</li><li>J Triangle Inequality Theorem</li></ul>	ne included angle	of two triangles?	10
<b>11.</b> Which assumption would you make to inc <b>A</b> $x < 5$ <b>B</b> $x \le 5$	directly prove $x >$ C $x = 5$	5? <b>D</b> $x > 5$	11
Chapter 5	49		Glencoe Geometry

## **Chapter Test Form 1**

Six forms of the Chapter Test are provided for each chapter. Form 1 contains multiple-choice questions and is intended for use with below grade level students.

NAME	DATE	PERIOD
Chapter 5 Test, Fe	orm 1 (continued)	
12. Find the possible values for $m \angle 1$ . F 180 > $m \angle 1$ > 62 G 90 > $m \angle 1$ > 62	<b>H</b> $0 < m \angle 1 < 62$ <b>J</b> $m \angle 1 = 118$	12
<ul> <li>13. Find the value of <i>x</i>.</li> <li>A 5</li> <li>B 7</li> </ul>	$\begin{array}{c} \mathbf{C} \ 10 \\ \mathbf{D} \ 15 \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ W \\ \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ W \\ \end{array} \xrightarrow[N]{} \begin{array}{c} 15 \\ W \\ \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \\\end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \\\end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \\\end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \end{array} \xrightarrow[N]{} \begin{array}{c} x+3 \\ T \\ \\\end{array} $	13
<b>14.</b> If <i>D</i> is the circumcenter of $\triangle ABC$ as <b>F</b> 4 <b>G</b> 6	$\begin{array}{c} \text{and } AD = 6, \text{ find } BD. \\ \textbf{H} 9 \\ \textbf{J} 12 \\ A \end{array} \qquad \qquad$	14
<b>15.</b> Choose the assumption you would r A $x < 3$ B $x \ge 3$	nake to start an indirect proof of $x > 3$ . $\mathbf{C} x \le 3$ $\mathbf{D} x = 3$	15
<ul> <li>16. Choose the assumption you would r Given: a ∦ b</li> <li>Prove: ∠1 and ∠2 are not supplement F a ∥ b</li> <li>G ∠1 and ∠2 are supplementary.</li> </ul>	make to start an indirect proof. entary. $\mathbf{H} \angle 1 \cong \angle 2$ $\mathbf{J} \angle 1$ and $\angle 2$ are complementary.	16
<b>17.</b> Which of the following sets of num <b>A</b> 12, 9, 4 <b>B</b> 1, 2, 3	bers can be the lengths of the sides of a triangle? C 5, 5, 10 $\mathbf{D} \sqrt{2}, \sqrt{5}, \sqrt{18}$	17
<b>18.</b> $\overline{BF}$ is a median of $\triangle BEC$ . If $EC = 1$ F 5 G 7.5	5, find FC. H 10 J 30 A D E F C	18
For Questions 19 and 20, refer to the	figures.	
<b>19. Given:</b> $\overline{AC} \cong \overline{DF}$ , $\overline{AB} \cong \overline{DE}$ , $m \angle A \cong \overline{DE}$ , $m \angle A \cong \overline{DE}$ , $m \angle A \cong \Delta BC \cong \Delta DEF$ <b>B</b> $BC = EF$	$ \begin{array}{c} > m \angle D \\ \text{ge Theorem?} \\ \mathbf{C} BC < EF \\ \mathbf{D} BC > EF \end{array} \qquad \qquad \begin{array}{c} A \\ B & \frown C \\ D & BC \\ E & \frown F \end{array} $	19
<b>20. Given:</b> $\overline{AB} \cong \overline{DE}$ , $\overline{BC} \cong \overline{EF}$ , $AC <$ Which can be concluded by the Cor $\mathbf{F} \ m \angle B < m \angle E$ $\mathbf{G} \ m \angle B > m \angle E$	DF were of the Hinge Theorem? $\mathbf{H} \ m \angle B = m \angle E$ $\mathbf{J} \ \Delta BAC \cong \Delta EDF$	20
<b>Bonus</b> $\overline{QS}$ is a median of $\triangle PQR$ with p If $PS = x^2 - 3x$ and $SR = 2x + 6$ value(s) of x.	point S on $\overline{PR}$ . 5, find the possible	B:
Chapter 5	50	Glencoe Geometry

Chapter Test Form 1

SCORE \_\_\_\_\_

#### NAME \_\_\_\_

# Chapter 5 Test, Form 2A

Write the letter for the correct answer in the blank at the right of each question.

For Questions 1-4, refer to the	figure.			
1. Name an angle bisector.			H K	
$\mathbf{A} \ \overline{KI} \qquad \qquad \mathbf{B} \ \overline{GL}$	$\mathbf{C} \overleftarrow{JM}$	$\mathbf{D} \ \overline{HJ}$		1
<b>2.</b> Name a median.			$I \xrightarrow{I} G$	
$\mathbf{F}  \overline{KI} \qquad \qquad \mathbf{G}  \overline{GL}$	$\mathbf{H} \overleftarrow{JM}$	$\mathbf{J} \ \overline{HJ}$		2
<b>3.</b> Name an altitude.				
$\mathbf{A} \ \overline{KI} \qquad \qquad \mathbf{B} \ \overline{GL}$	$\mathbf{C} \overleftarrow{JM}$	$\mathbf{D} \ \overline{HJ}$		3
4. Name a perpendicular bisecto	r.			
$\mathbf{F}\overline{KI} \qquad \qquad \mathbf{G}\overline{GL}$	H JM	J HJ		4
For Questions 5-7, refer to the which is a true statement for th	figure to determine e given information	x 	Y	
<b>5.</b> $\overline{YW}$ is an angle bisector.		Z		
$A \ \angle YWZ$ is a right angle. $P \ \angle YVW \sim \ \angle ZVW$	$\mathbf{C} X W = W Z$ $\mathbf{D} V V = Z V$			5.
6. $\overline{YW}$ is an altitude. <b>F</b> $\angle YWZ$ is a right angle. <b>G</b> $\angle XYW \cong \angle ZYW$	$\mathbf{H} XW = WZ$ $\mathbf{J} XY = ZY$			6
7. $\overline{YW}$ is a median. A $\angle YWZ$ is a right angle. B $\angle XYW \cong \angle ZYW$	$\mathbf{C} XW = WZ$ $\mathbf{D} XY = ZY$			7
			74°	
8. Name the longest side of $\triangle AI$ F $\overline{AB}$ H $\overline{AC}$	3C. G <u>BC</u>	J canno	ot tell $A^{22^{\circ}}$ $84^{\circ}$	8
9. Name the angle with greatest $A \angle D$ $B \angle E$	measure in $\triangle DEF$ . C $\angle F$ D cannot tell	E	F 7 D	9
<ul><li>10. Which theorem compares the F Hinge Theorem</li><li>G Converse of the Hinge Theorem</li></ul>	sides of the same tri H Exterior A corem J Triangle In	angle? ngle Inequ equality Tl	ality Theorem neorem	10
<ul> <li>11. Tisha wants to plant a garden backyard is bordered by the blong, and fence B that is 35 fe A corner between fences A at B all three corners have the sa C corner between the back of D corner between the back of</li> </ul>	in the widest corner tack of the house that eet long. Which corn and B ame measure The house and fence The house and fence	of her trian is 50 feet er has the v A B	ngular backyard. The long, fence A that is 27 feet videst measure?	11
Chapter 5		51		Glencoe Geometry

**Chapter Test Form 2A** 

Form 2A contains multiple-choice questions aimed at on-grade level students, similar in format to other test settings.

NAME	DATE	PERIOD
Chapter 5 Test,	Form 2A (continued)	
<b>12.</b> Find the possible values for $m \neq 1$	~	
$\mathbf{F} \ 90 > m \angle 1 > 74$	<b>H</b> $0 < m \angle 1 < 74$	
<b>G</b> $180 > m \angle 1 > 74$	$\mathbf{J} \ m \angle 1 = 106 \qquad \boxed{74^{\circ} \qquad 1}$	12
<b>13.</b> Find the value of $x$ .	x + 2 C	
A 9	$\mathbf{C}$ 27 $x+7$ $\mathbf{B}$	10
<b>B</b> 11	D 32	13
14. Which is another name for an ind	direct proof?	
F proof by deduction	H proof by inverse	14
G proof by converse	J proof by contradiction	14
15. Choose the assumption you wou $A = 2$	Id make to start an indirect proof of $x < 2$ .	15
$\mathbf{A} x \ge 2 \qquad \qquad \mathbf{B} x \ge 2$	$\mathbf{C} \mathbf{x} = 2$ $\mathbf{D} \mathbf{x} \le 2$	15
<ul> <li>16. Choose the assumption you wou Given: ∠1 is an exterior angle of Prove: m∠1 = m∠B + m∠C</li> <li>F ∠1 is not an exterior angle of ∠AB</li> <li>H m∠1 ≠ m∠B + m∠C</li> <li>I m∠1 = m∠B</li> </ul>	ld make to start an indirect proof. f △ <i>ABC</i> . △ <i>ABC</i> . β <i>C</i> .	16.
$\mathbf{J}$ $m \geq 1 - m \geq D$		
17. Which of the following sets of n	umbers can be the lengths of the sides of a triangle?	
<b>A</b> 6, 6, 12 <b>B</b> 6, 7, 13	<b>C</b> $\sqrt{2}$ , $\sqrt{5}$ , $\sqrt{15}$ <b>D</b> 2.6, 8.1, 10.2	17
<b>18.</b> What is the relationship between $\mathbf{F} QS = RS$	the lengths of $\overline{QS}$ and $\overline{RS}$ ? H $QS > RS$	18.
G QS < RS	<b>J</b> cannot tell $Q \sim S$	
<b>19.</b> What is the relationship between $A D C = A D$	the lengths of $\overline{DC}$ and $\overline{AD}$ ?	
$\mathbf{A} DC < AD$ $\mathbf{B} DC > 4D$	C DC = AD <b>D</b> cannot tell $B \leq 30^{\circ}$	19
<b>20.</b> What is the relationship between $\mathbf{F} m \langle 1 = m \rangle$	the measures of $\angle 1$ and $\angle 2$ ? 15	
$\mathbf{G} m \ge 1 \le m \ge 2$	J cannot tell 8/1 13	20
<b>-</b>	$\frac{1}{2}$	
<b>Bonus</b> $\overline{YW}$ bisects $\angle XYZ$ in $\triangle XYZ$	Point W is on $\overline{XZ}$ .	
If $m \angle XYW = 2x + 18$ and m find the possible value(s) of	$\angle ZYW = x^2 - 5x,$ f x.	B:
	50	
Chapter 5	52	Glencoe Geometry

Chapter Test Form 2A

SCORE \_\_\_\_\_

#### NAME \_\_\_

# Chapter 5 Test, Form 2B

Write the letter for the correct answer in the blank at the right of each question.

<b>For Questions</b>	1-4,	refer	to	the	figure.	
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<b>F</b> Hinge Theorem <b>G</b> Converse of the Hinge Theorem	<b>H</b> Exterior Angle Inequality Theorem <b>J</b> Triangle Inequality Theorem	10
<b>10.</b> Two sides of a triangle are congrue angle in the first triangle has a grea triangle. These are the assumptions	nt to two sides of another triangle and the included ter measure than the included angle in the second of which theorem?	
<ul> <li>9. Name the angle with the greatest m</li> <li>A ∠G</li> <li>B ∠H</li> </ul>	easure in $\triangle GHI$ . <b>C</b> $\angle I$ <b>D</b> cannot tell $H_{5}$ $I_{7}$ G	9
8. Name the longest side of $\triangle ABC$ . <b>F</b> $\overline{AB}$ <b>G</b> $\overline{BC}$	$\mathbf{H} \overline{AC}$ <b>J</b> cannot tell $A \xrightarrow{f_{0^{\circ}}} C$	8
7. $\overline{FG}$ is an angle bisector. A $\angle DGF$ is a right angle. B $DF = EF$	$\mathbf{C} \ DG = GE$ $\mathbf{D} \ \angle DFG \cong \angle EFG$	7
6. $\overline{FG}$ is a median. $\mathbf{F} \angle DGF$ is a right angle. $\mathbf{G} DF = EF$	$ \mathbf{H} DG = GE  \mathbf{J} \angle DFG \cong \angle EFG $	6
5. $\overline{FG}$ is an altitude. A $\angle DGF$ is a right angle. B $DF = EF$	$E \xrightarrow{F} F$ $C DG = GE$ $D \angle DFG \cong \angle EFG$	5
For Questions 5-7, refer to the figure is a true statement for the given info	to determine which g	
<b>4.</b> Name an altitude. <b>F</b> $\overline{RW}$ <b>G</b> $\overline{RP}$	<b>H</b> $\overline{QT}$ <b>J</b> $\overline{RU}$	4
<b>3.</b> Name a perpendicular bisector. <b>A</b> $\overline{RW}$ <b>B</b> $\overrightarrow{SV}$	$\mathbf{C} \ \overline{QT} \qquad \mathbf{D} \ \overline{RU}$	3
<b>2.</b> Name an angle bisector. <b>F</b> $\overline{RW}$ <b>G</b> $\overleftrightarrow{SV}$	<b>H</b> $\overline{QT}$ <b>J</b> $\overline{RU}$	2
<b>A</b> $\overline{RW}$ <b>B</b> $\overline{SV}$	$\begin{array}{c} \mathbf{C} \ \overline{\mathbf{QT}} \\ \mathbf{D} \ \overline{\mathbf{RU}} \end{array} \qquad P \xrightarrow{\mathbf{VQ}} \begin{array}{c} \mathbf{V} \\ \mathbf{V} \\ \mathbf{V} \end{array} $	1

Chapter Test Form 2B

Form 2C contains free-response questions aimed at on-grade level students, similar in format to other test settings.

DATE

PERIOD

NAME

DATE \_\_\_\_\_ PERIOD \_\_\_\_\_

Chapter 5 Test, Fo	orm 2C	SCORE
<b>1.</b> Solve $x - 12 > 1$ . Then graph your so	lution on a number line.	1
Solve each inequality.		9 10 11 12 13 14 15 16 17
<b>2.</b> 7 + <i>z</i> < 3		2
$3.\frac{b}{8} > -\frac{1}{5}$		3
<b>4.</b> $\frac{t}{6} \ge 14$		4
<b>5.</b> $-19.8 \ge 3.6y$		5
<b>6.</b> –4 <i>r</i> < 22		6
7. $4x - 5 < 2x + 11$		7
<b>8.</b> $5(p+2) - 2(p-1) \ge 7p + 4$		8
<b>9.</b> $1.3(c-4) \le 2.6 + 0.7c$		9
Solve each compound inequality. Then	graph the solution set.	
<b>10.</b> $3w < 6$ and $-5 < w$		<b>10.</b>
<b>11.</b> $-4 \le n \text{ or } 3n + 1 < -2$		11. -4-3-2-1 0 1 2 3 4
<b>12.</b> $-4x - 8 \ge -4$ or $7x - 5 < 16$		12
For Questions 13 and 14, solve each inc	equality. Then graph the solution set.	
<b>13.</b> $ 1 - x  \le 2$		<b>13.</b> <u>-4-3-2-1 0 1 2 3 4</u>
<b>14.</b> $ 3 - 2x  \ge 1$		<b>14.</b>
Chapter 5	55	Glencoe Algebra 1

Chapter Test Form 2C

Form 2C contains free-response questions aimed at on-grade level students, similar in format to other test settings.

DATE PERIOD

NAME

**Chapter Test Form 2C** 

Chapter 5 Test, Fo	rm 2D	SCORE
1. Name a perpendicular bisector.		1
2. The perimeter of <i>PRQS</i> is 34. Find the of <i>x</i> . Then describe the relationship be $\overrightarrow{RS}$ and $\overrightarrow{PQ}$ .	e value tween $ \begin{array}{c}                                     $	2
<b>3.</b> If point <i>N</i> is the centroid of $\triangle HIJ$ , IM = 18, $KN = 4$ , and $HL = 15$ , find J.	N. H	3
<b>4.</b> The vertices of $\triangle DEF$ are $D(4, 12)$ , $E($ coordinates of the circumcenter of $\triangle D$	(14, 6), and <i>F</i> (–6, 2). Find the <i>DEF</i> .	4
<b>5.</b> If $\overline{RU}$ is an altitude for $\triangle RST$ , find the	value x. $\begin{array}{c} T \\ \hline \\ U \\ S \end{array} \xrightarrow{(5x - 10)^{\circ}} R \\ R \end{array}$	5
<ul> <li>6. A rubber doorstop has a hypotenuse measuring 7<i>z</i> and a height measuring <i>x</i> – 5. Write an inequality relating <i>x</i> an</li> </ul>	$dz. \qquad \frac{7z}{150^{\circ}} \qquad x-5$	6
7. List the angles of $\triangle TUV$ in order from smallest to largest measure.	$T \xrightarrow{3.9}_{5} V$	7
<b>8.</b> List the sides of $\triangle FGH$ in order from shortest to longest.	$H \stackrel{57^{\circ}}{\underbrace{82^{\circ}} 41^{\circ}} G$	8
9. Name the longest segment.	L 30° 34° 96° 50° N	9
<ol> <li>Write the assumption you would make statement. If n is an even number, then</li> </ol>	e to start an indirect proof of the $n^2$ is an even number.	10
<b>11.</b> Write the assumption you would make statement. If $\overline{AD}$ is an angle bisector of an altitude.	to start an indirect proof of the of equilateral triangle ABC, then $\overline{AD}$ is	11
Chapter 5	57	Glencoe Geon

Chapter Test Form 2D

Form 2DA contains free-response questions aimed at on-grade level students, similar in format to other test settings.

# Chapter 5 Test, Form 2D (continued)

12. Write the assumption you would make to start an indirect proof for the following.

**Given:** *V* is not the midpoint of  $\overline{PQ}$ ;  $< P \cong < Q$ **Prove:**  $\overline{SV} \boxtimes \overline{PO}$ .

- 13. The measures of two sides of a triangle are 14 feet and 29 feet. If the measure of the third side is x feet, find the range for the value of x.
- **14.**  $\overline{BD}$  is a median of  $\triangle ABE$ . If AD = 8, find DE.
- **15.** If  $\overrightarrow{YW}$  bisects  $\angle XYZ$ , find the value of x.
- **16.** Write an inequality relating  $m \ge 1$  and  $m \ge 2$ .
- 17. Write an inequality relating BC and ED.







information for each corresponding location.

For Questions 18-20, complete the proof below by supplying the missing

**Given:** K is the midpoint of  $\overline{AB}$ .  $m \angle MKB < m \angle MKA$ **Prove:** MB < AM

**Proof:** 

Statements	Reasons
<b>1.</b> <i>K</i> is the midpoint of $\overline{AB}$ .	1. Given
$m \angle MKB \le m \angle MKA$	
<b>2.</b> $\overline{BK} \cong \overline{KA}$	<b>2.</b> (Question 18)
3. $\overline{MK} \cong \overline{MK}$	<b>3.</b> (Question 19)
<b>4.</b> <i>MB</i> < <i>AM</i>	4. (Question 20)

Bonus Write an equation in slope-intercept form for the perpendicular bisector of  $\overline{CE}$ .



Chapter 5

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Glencoe Geometry

**Chapter Test Form 2D** 

NAME	DATE	PERIOD
Chapter 5 Test, F	orm 3	SCORE
1. If point G is the centroid of $\triangle ABC$ , AE = 24, $DG = 5$ , and $CG = 14$ , fin	d $DB$ . $D$ $E$ $B$ $C$	1
<b>2.</b> The vertices of $\triangle EFG$ are $E(2, 4)$ , <i>I</i> Find the coordinates of the orthocen	F(10, -6), and $G(-4, -8)$ . nter of $\triangle EFG$ .	2
<b>3.</b> If $\overline{JL}$ is a median for $\triangle IJK$ , find the	value of x. $I = \frac{J}{3x + 10 \ L} = \frac{1}{2x + 42} K$	3
<b>4.</b> Write a compound inequality for the possible measures of $\Box L$ .	$e \xrightarrow{146^\circ} M$	4
<b>5.</b> List the angles of $\triangle GHI$ in order from smallest to largest measure.	$\int_{1}^{7} \frac{G_8}{9.6} H$	5
<b>6.</b> List the sides of $\triangle PQR$ in order from	m shortest to longest. $Q_{80^{\circ}}$	6
7. Name the shortest and the longest s	egments. $W = \frac{1}{53^{\circ}} \frac{64^{\circ}}{53^{\circ}} \frac{64^{\circ}}{53^{\circ}} \frac{64^{\circ}}{53^{\circ}} \frac{72^{\circ}}{72^{\circ}} \frac{1}{72^{\circ}} \frac{1}{72^$	7
8. Write the assumption you would mast statement. If $2x + 6 = 12$ , then $x = 3$	ake to begin an indirect proof of the 3.	8
9. Determine whether 8, 4, and 2 can Write <i>yes</i> or <i>no</i> . Explain.	be the lengths of the sides of a triangle.	9
<b>10.</b> Write the assumption you would m statement. <i>The three angle bisector</i>	ake to begin an indirect proof of the sof a triangle are concurrent.	10
<b>11.</b> Write and solve an inequality for <i>x</i> .	$(3x-4)^{\circ} \xrightarrow{6}{10}$ $(12x-31)^{\circ} \xrightarrow{5}{4}$ 10	11
Chapter 5	59	Glencoe Geometry

# Chapter Test Form 3

Form 3 contains free-response questions for use with above grade level students.

# x + 18E 2x + 18 12. 13.\_\_\_\_\_ 14. 15. 16.\_\_\_\_\_ **16.** Write and solve an inequality for the value of *x*. x + 20

DATE

### For Questions 17-20, complete the proof below by supplying the missing information for each corresponding location.

**Given:** XW = YZ, XK > WK, and KZ > KY**Prove:**  $m \angle XWZ > m \angle YZW$ 

**Proof:** 

Statements	Reasons
1. XW = YZ, XK > WK,	1. Given
and $KZ > KY$	
<b>2</b> . $\overline{XW} \cong \overline{YZ}$	<b>2.</b> (Question 17)
<b>3</b> . $XZ > WY$	<b>3.</b> (Question 18)
4. $\overline{WZ} \cong \overline{WZ}$	<b>4.</b> (Question 19)
<b>5</b> . $m \angle XWZ > m \angle YZW$	5. (Question 20)

Bonus Write an equation in slope-intercept form for the line containing the median to  $\overline{DE}$ .



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Chapter 5

# Chapter 5 Test, Form 3 (continued)

- **12.** If  $\overline{FH}$  is a median of  $\triangle EFG$ , find the perimeter of  $\triangle EFG$ .
- 13. Write the assumption you would make to start an indirect proof for the following. **Given:**  $\overline{AB} \ncong \overline{DE}$  and  $\overline{AC} \cong \overline{CD}$ **Prove:**  $\angle B \cong \angle E$
- 14. The measures of two sides of a triangle are 24 inches and 29 inches. If the measure of the third side is x inches, find the range for the value of x.
- **15.**  $\overline{YW}$  is the perpendicular bisector of  $\overline{ZT}$ . If TW = 3, YW = 8, and XZ = 12. Find XY.










Glencoe Geometry

**Chapter Test Form 3** 

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\_\_\_\_\_PERIOD

# **ASSESSMENT RESOURCES**

The Extended Response Test contains performance-assessment tasks.

# **Chapter 5 Extended-Response Test**

SCORE

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem.

DATE

1. Two sticks are bent and connected with a rubber band as shown in the diagram. Describe what happens to the rubber band as the ends of the sticks are pulled farther apart. Name the theorem this situation illustrates.



2. Mary says  $\overline{HE}$  is a perpendicular bisector of  $\overline{DG}$  and Ashley says it is not. Who is correct? Explain your answer.



**3.** Suppose  $\overline{BD}$  is drawn on this figure so that point *D* is on  $\overrightarrow{AC}$  and has a length of 6 centimeters. If the shortest distance from *B* to  $\overrightarrow{AC}$  is 5 centimeters, in how many different places on  $\overrightarrow{AC}$  could point *D* be located? Explain.



- 4. Draw a triangle that satisfies each situation.
  - **a.** Two of the sides are altitudes.
  - **b.** The altitudes intersect outside the triangle.
  - c. The altitudes intersect inside the triangle.
  - **d.** The altitudes are also the medians of the triangle.

Chapter 5

**Extended Response Test** 

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Glencoe Geometry

# **5 Standardized Test Practice** (Chapters 1-5)

SCORE \_\_\_\_\_

Ins	structions: Fill in the appropria	Part 1: Multiple Choice ate circle for the best answer.	
<b>1.</b> If $\angle BXY$ is a rig I $m \angle BXY = 9$ II The measur	the state of the	tents are true? (Lesson 1-4) $XY$ would be 90.	
III The measure A I only B	e of an angle supplementary I and III C I, II, and II	If $\Delta BXY$ would be 90. If <b>D</b> I and II	1. A B C D
2. Which is the co then $x = 5$ ? (Les F If $m \angle K \neq 45$ ,	ntrapositive of the condition sson 2-3) then $x \neq 5$ <b>H</b> If $x = 5$ , the	nal statement If $m \angle K = 45$ , then $m \angle K = 45$	2 P P P P
<b>G</b> If $x \neq 5$ , then	$m \angle K \neq 45$ <b>J</b> II $m \angle K \neq 4$	s, then $x = 5$	2.0000
3. Find <i>m∠HJK</i> . ( A 33 B 45	Lesson 3-2) H' C 78 D 147	33° 45° K	3. (A) (B) (C) (D)
4. The line $y - 5 =$ F $m = -1$ , conta G $m = 1$ , contai	x - x + 3 satisfies which cond x = -x + 3 satisfies which cond x = -1, co x = -1, cond x = -1, cond y = -1,	litions? (Lesson 3-4) ontains (5, 3) ntains (5, -3)	4. F G B D
5. Given $D(0, 4)$ , would make $\Delta A$	$E(2, 4), F(2, 1), A(0, 2), and  ABC \cong \triangle DEF?$ (Lesson 4-4)	C(-2, -1), which coordinates for	В
<b>A</b> <i>B</i> (-2, 2) <b>B</b> <i>B</i> (0, 1)	$\hat{\mathbf{C}} B(0, 0)$ <b>D</b> $B(-1, 0)$	, ,	5. A B C D
<ul> <li>6. In △XYZ, which</li> <li>F perpendicular</li> <li>G angle bisector</li> </ul>	type of line is $\ell$ ? (Lesson : bisector <b>H</b> altitude r <b>J</b> median	5-1) $x \xrightarrow{\gamma} t\ell$	6. F G B O
7. Which assumpt <i>If</i> $2x - 5 < 17$ , <i>t</i> . <b>A</b> $x < 11$ <b>B</b>	ion would you make to start hen $x < 11$ ? (Lesson 5-4) $x \ge 11$ C $x > 11$	t an indirect proof of the statement $\mathbf{D} \ x \neq 11$	7. (8) (6) (6) (9)
8. Which inequali	ty describes the possible	45°/ 35°	
values of $x$ ? (Let $\mathbf{F} x > 6$ $\mathbf{G} x < 6$	$\begin{array}{c} \text{(3)} $	3x - 7 x + 5	8. (F) (G) (B) (J)
Chapter 5		62	Glence

**Standardized Test** 

Standardized Test Practice is cumulative and includes multiple-choice and short response questions.

\_\_\_

5 Standar	dized Test	Practice	<b>2</b> (continued)	
For Questions 9-11 re	fer to the figure.	E	$(2z+3)^{\circ}$	
<b>9.</b> If $m \angle D = 42$ , what <b>A</b> 18 <b>B</b> 40	is <i>m∠E</i> ? (Lesson 4-2) C 43 D 81	100 m D 132 m	123° F	9. A B C D
10. Which of the follow F 20 m	wing could not be the len G 53 m	ngth of <i>EF</i> ? (Les H 75 m	son 5-5) J 80 m	10. © © ® O
<b>11.</b> Which of the follow $\mathbf{A} \ z > 60$	wing inequalities is true? $\mathbf{B} - 1\frac{1}{2} < z < 60$	(Lesson 5-3) C 0 < <i>z</i> < 123	$\mathbf{D} - 1 \frac{1}{2} \le z \le 60$	11. A B C D
For Questions 12 and	13 refer to the figure.	PQ		
12. Which line segmen (Lesson 5-3) $\mathbf{F} \overline{PQ}$ $\mathbf{G} \overline{RS}$	t is the shortest? $\mathbf{H} \overline{QR}$ $\mathbf{J} \overline{PS}$	28	r 120° 30° R S	12. 🕞 🌀 谢 🛈
<b>13.</b> Which line segmen $\mathbf{A} \overline{PQ}$	t is the longest? (Lesson <b>B</b> $\overline{QR}$	5-3) C <u>RS</u>	$\mathbf{D} \ \overline{PS}$	13. (A) (B) (C) (D)
14. What is the perimer (Lesson 3-6) F −12	ter of $\triangle MOP$ with vertic G –5	es M(0, 4), O(0, H 5	0), and <i>P</i> (3, 0)? J 12	14. Ē G B O
<b>15.</b> Which of the follow triangle? (Lesson 5-	ving sets of numbers car 5)	not be lengths o	f the sides of a	
A 1, 2, 3	<b>B</b> 2, 3, 4	<b>C</b> 3, 4, 5	<b>D</b> 4, 5, 6	15. A B C D
	<b>Instructions:</b> Enter answer in a column circle that correspond	Part 2: Gridded r your answer by n box and then s onds to that entry	I Response y writing each digit of the hading in the appropriate /.	
<ul> <li>16. If BD is an altitude of x. (Lesson 5-2)</li> <li>(2x + 17)*</li> <li>A D</li> <li>D</li> <li>17. The measures of tw and 15. The range f side n would be 4 </li> </ul>	of $\triangle ABC$ , find the value $(3x-2)^{\circ}$	e 16.		
Chapter 5		63		Glencoe Geometry

**Standardized Test** 

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# 5 Standardized Test Practice (continued)

Instructions: Write your answer in the space provided.Find a counterexample for the statement. Five is the only whole number between 4.5 and 6.1. (Lesson 2-1)18	Part 3: Short Response	
Find a counterexample for the statement. Five is the only whole number between 4.5 and 6.1. (Lesson 2-1)18.18	Instructions: Write your answer in the space provided.	
What is the length of the side opposite the vertex angle of isosceles $\triangle XYZ$ with vertices at $X(-3, 4)$ , $Y(8, 6)$ , and $Z(3, -4)$ ? (Lesson 4-1)19What is the distance between $A(-12, 12)$ and $B(-5, -12)$ ? (Lesson 3-6)20The vertices of $\triangle ABC$ are $A(-2, 3)$ , $B(4, 3)$ , and $C(-2, -3)$ . Find the coordinates of each point of concurrency of $\triangle ABC$ . (Lesson 5-2)21.aa. circumcenterbb. centroidcc. orthocentercGiven the line $y = 5x + 2$ .a. What is the equation of the parallel line that intercepts the <i>y</i> -axis at -2? (Lesson 3-5)22ab. What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6)bc. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)c	Find a counterexample for the statement. <i>Five is the only whole number between 4.5 and 6.1.</i> (Lesson 2-1)	18
What is the distance between $A(-12, 12)$ and $B(-5, -12)$ ? (Lesson 3-6)20The vertices of $\triangle ABC$ are $A(-2, 3)$ , $B(4, 3)$ , and $C(-2, -3)$ . Find the coordinates of each point of concurrency of $\triangle ABC$ . (Lesson 5-2)21.aa. circumcenter21.ab. centroidbc. orthocenterc Given the line $y = 5x + 2$ .ca. What is the equation of the parallel line that intercepts the y-axis at -2? (Lesson 3-5)22ab. What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6)bc. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)c	What is the length of the side opposite the vertex angle of isosceles $\triangle XYZ$ with vertices at $X(-3, 4)$ , $Y(8, 6)$ , and $Z(3, -4)$ ? (Lesson 4-1)	19
The vertices of $\triangle ABC$ are $A(-2, 3)$ , $B(4, 3)$ , and $C(-2, -3)$ . Find the coordinates of each point of concurrency of $\triangle ABC$ . (Lesson 5-2) <b>a.</b> circumcenter <b>21.ab.</b> centroid <b>b.c.</b> orthocenter <b>c.c.</b> orthocenter <b>c.c.</b> orthocenter <b>c.d.</b> What is the equation of the parallel line that intercepts the y-axis at -2? (Lesson 3-5) <b>22a.b.</b> What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6) <b>b.c.</b> Find the point of intersection of the lines found in part <b>a</b> and <b>b</b> above? (Lesson 3-6) <b>b.</b>	What is the distance between $A(-12, 12)$ and $B(-5, -12)$ ? (Lesson 3-6)	20
a. circumcenter21.ab. centroidb.c. orthocenterc.c. orthocenterc Given the line $y = 5x + 2$ .a. What is the equation of the parallel line that intercepts the y-axis at $-2$ ? (Lesson 3-5)22a.b. What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6)b.c. Find the point of intersection of the lines found in part <b>a</b> and <b>b</b> above? (Lesson 3-6)c.	The vertices of $\triangle ABC$ are $A(-2, 3)$ , $B(4, 3)$ , and $C(-2, -3)$ . Find the coordinates of each point of concurrency of $\triangle ABC$ . (Lesson 5-2)	
b. centroidbc. orthocenterc Given the line $y = 5x + 2$ .ca. What is the equation of the parallel line that intercepts the y-axis at -2? (Lesson 3-5)22ab. What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6)bc. Find the point of intersection of the lines found in part <b>a</b> and <b>b</b> above? (Lesson 3-6)c	a. circumcenter	21.a
c. orthocenterc	b. centroid	b
<ul> <li>Given the line y = 5x + 2.</li> <li>a. What is the equation of the parallel line that intercepts the y-axis at -2? (Lesson 3-5)</li> <li>b. What is the equation of the perpendicular line that intersects y = 5x + 2 at x = 0? (Lesson 3-6)</li> <li>c. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)</li> <li>c</li> </ul>	c. orthocenter	¢
<ul> <li>a. What is the equation of the parallel line that intercepts the <i>y</i>-axis at -2? (Lesson 3-5)</li> <li>b. What is the equation of the perpendicular line that intersects y = 5x + 2 at x = 0? (Lesson 3-6)</li> <li>c. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)</li> <li>c</li> </ul>	Given the line $y = 5x + 2$ .	
<ul> <li>b. What is the equation of the perpendicular line that intersects y = 5x + 2 at x = 0? (Lesson 3-6)</li> <li>c. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)</li> <li>c</li> </ul>	<b>a.</b> What is the equation of the parallel line that intercepts the <i>y</i> -axis at $-2$ ? (Lesson 3-5)	22a
<ul> <li>c. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)</li> <li>c</li> </ul>	<b>b.</b> What is the equation of the perpendicular line that intersects $y = 5x + 2$ at $x = 0$ ? (Lesson 3-6)	b
	c. Find the point of intersection of the lines found in part a and b above? (Lesson 3-6)	c

Chapter 5

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Glencoe Geometry

Standardized Test
## **Program Resources Throughout**

Support each student's tactile learning modality with resources that help you facilitate a learning environment that connects math to their world beyond the classroom.

eSolutions provides practice beyond the student edition.

**Math Triumphs** provide scaffolding practice and other tools to help students who are falling behind.

**Diagnostic and Placement Tests** and **Texas Instrument Easy Files** for your calculator provide practice opportunities beyond the text.

Multilingual Glossary to help English Language Learners in your classroom.

**Graphing Tool** illustrates to students as they manipulate it, how different variables create changes of the function.

**eToolkit** is a collection of digital resources online to explore different concepts with real-world problem solving questions.

The Geometer's Sketchpad<sup>®</sup> is software that comes with activities to deepen student knowledge using hands-on activities.

**Math tools** engage your students and help them visualize abstract math concepts. Manipulation and experimentation are also built in for a seamless experience.





#### eSolutions

eSolutions provides the questions, answers, and solutions for questions in the student edition.

# Lesson

### **Fractions and Percents**

#### KEY Concept

Fractions and percents are different ways to show the same value. There are different ways to convert between them.



Memorize commonly used fractions and percents, such as  $\frac{1}{4} = 25\%$ .



Lesson 2-4 Fractions and Percents 53

VOCABULARY

the number below the bar

denominator

#### Math Triumphs

For students who are below grade level, Math Triumphs provides tools to identify areas of need, target instruction, scaffold practice, teach and review vocabulary, and assess to determine when students can advance and exit.



**Math Triumphs** 

Diagnostic and Placement Geometry This test contains 30 multiple-choice space on this page. Select the best a the blank at the right.	Name Date e questions. Work each p answer. Write the letter o	oroblem in the of the answer on	
<ul> <li>is writing a function to show the relation hours worked <i>h</i>, and her wages earned function, what does the independent v</li> <li>A the number of hours worked</li> <li>B the wage earned in one hour</li> <li>C the total wages earned</li> <li>D the amount of time Carla must worked</li> </ul>	onship between her I w. In Carla's variable represent? ork to earn \$1		
2 Which statement describes each order $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ed pair (x, y) in the table?	2 e of <i>x</i> .	
3 Which function describes the data in the x 0 1 2 y 3 5 7 A $y = x + 3$ B $y = 2x + 3$	the table? 3 9 y = 3x y = 3x - 1	3	Copyright © The McGraw-Hill Con is granted to reproduce for classroor
<ul> <li>What is the domain of the function f(x)</li> <li>F the set of all real numbers</li> <li>G the set of all real numbers except</li> <li>H the set of all real numbers except</li> <li>J the set of all real numbers except</li> </ul>	$= \frac{3}{x+2}?$ = x = -2 = x = 0 = x = 2	4	punies, Inc. Permission 1 use.
Diagnostic and Placement Tests	136	Diagnostic and	l Placement Tests

For students who are below grade level, Math Triumphs provides tools to identify areas of need, target instruction, scaffold practice, teach and review vocabulary, and assess to determine when students can advance and exit.



For each part, mark the box under the number of correctly answered questions.



Glossary					
A B C D E F G H	I J K L M N O P Q R S T U V W X Y Z				
	angle of elevation (n. 574) The angle between the line of sight				
angle of elevation	and the horizontal when an observer looks upward.				
angle of rotation					
apothem					
arc	angle of →				
area	depression				
auxiliary line	line of sight				
axiom	inte of sight				
axis	angle of elevation				
axis of symmetry					
base angle of an isosceles triangle					
base edges	T Contraction of the second seco				
Glosario					
Todos	I J K L M N U P Q K S I U V W X Y Z				
ángulo agudo	ángulo de elevación Ángulo formado por la horizontal y la				
ángulo central	línea de visión de un observador que mira hacia arriba.				
ángulo central de un polígono					
regular ángulo de depresión					
ángulo de elevación	ángulo de				
ángulo de la base de un triángulo isósceles					
ángulo de rotación	la linea				
ángulo del vértice un triángulo isosceles	Visual ungita				
ángulo externo	ángulo de depresión				
ángulo incluido					
ángulo inscrito					
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Multilingual Glossary

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#### TI Easy Files

TI Easy Files - TI-Nspire<sup>™</sup> or TI 83/84 family calculator resource files.



#### **Graphing Tool**

Use the Graphing Tools to investigate the effect that changing variables has on the graph of the function



#### eToolkit

The eToolkit provides students with a digital way to explore concepts and teachers with a way to create problem-based learning opportunities.



The Geometer's Sketchpad®

Materials required for The Geometer's Sketchpad® activities.

## **Professional Development**

### Learning for You

Teachers need to become students from time to time and we are here to help. With ever changing technology, built-in resources featuring best-practices, implementation support, alternative teaching practices, and much more makes staying up-to-date with changing classroom and student needs easier for you.



# GEOMETRY

**Professional Development** 

#### **TEACHER CENTER**

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#### **Professional Development**

On-demand webinars are available to you at point-of-use from the ConnectED Teacher Center dashboard.

#### PROFESSIONAL DEVELOPMENT

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