

# Lesson 92

## Exercise 1

### SCIENTIFIC NOTATION

#### — Workbook practice —

- a. Open your workbook to lesson 92, part 1. ✓  
• (Teacher reference:)

	$50,300 = \square \times 10^{\square}$
◆ Copy the digits before the final zeros.	$5\ 03 \times 10^{\square}$
◆ Write a decimal point after the first digit.	$5.03 \times 10^{\square}$
◆ Write the exponent for 10.	$5.03 \times 10^4$

- b. The box shows how to rewrite a number as something multiplied by 10 to some power.
- Here's how you do that. The number is 50,300. First you copy the digits that are before the final zeros. That's 5, zero, 3.
  - Which digits do you copy? (Signal.) 5, 0, 3.
  - You write a decimal point after the first digit.
  - What's the first digit? (Signal.) 5.  
So you write a decimal point after the 5.
  - What decimal value do you write in the first box? (Signal.) 5.03.
  - Then you figure out the exponent of 10.
  - What's the exponent of 10? (Signal.) 4.  
You write the exponent in the other box.
  - 50,300 equals 5.03 times  $10^4$ .

#### — Workbook practice —

- a. Find part 2 of your workbook. ✓  
b. Problem A: 752,000.  
• What are the digits before the zeros? (Signal.) 7, 5, 2.  
• So what decimal value do you write in the first box? (Signal.) 7.52.  
c. Problem B: 7,131,000.  
• What are the digits before the zeros? (Signal.) 7, 1, 3, 1.  
• So what decimal value do you write in the first box? (Signal.) 7.131.  
d. Problem C: 37,000.  
• What are the digits before the zeros? (Signal.) 3, 7.  
• So what decimal value do you write in the first box? (Signal.) 3.7.

- e. Problem D: 8040.  
• What are the digits before the final zero? (Signal.) 8, 0, 4.  
• So what decimal value do you write in the first box? (Signal.) 8.04.  
f. Problem E: 70,180,000.  
• What are the digits before the final zeros? (Signal.) 7, 0, 1, 8.  
• So what decimal value do you write in the first box? (Signal.) 7.018.  
g. After you write the decimal value in the first box, you write the exponent for 10.  
• You just start after the first digit of the original value and write the number of places to the end of the original value.  
h. (Write on the board:) [92:1A]

a.  $752,000 = \square \times 10^{\square}$

- Here's problem A. Tell me the decimal value that goes in the first box. (Signal.) 7.52.  
• (Write to show:) [92:1B]

a.  $752,000 = \square 7.52 \square \times 10^{\square}$

- Now I start after the first digit of 752,000 and count the places to the end of the number.  
• Raise your hand when you know the number of places. ✓  
• Everybody, how many places? (Signal.) 5.  
• So the exponent for 10 is 5.  
• (Write to show:) [92:1C]

a.  $752,000 = \square 7.52 \square \times 10^5$

- 752,000 equals 7.52 times  $10^5$ .  
i. Your turn: Complete item A. Then do item B. Pencils down when you're finished. ✓  
j. Item B. You started with the number 7,131,000. What did you write in the first box? (Signal.) 7.131.  
• Then you counted the places after the first digit to the end of the original number. How many places? (Signal.) 6.  
• So the exponent of 10 is 6.  
• What does 7,131,000 equal? (Signal.)  $7.131 \times 10^6$ .

- k. Work the rest of the problems in part 2. Pencils down when you're finished. (Observe students and give feedback.)
- l. Check your work.
- I'll read the first value of each equation. You'll tell me what that value equals.
  - Item C: 37,000. What does it equal? (Signal.)  $3.7 \times 10^4$ .
  - Item D: 8040. What does it equal? (Signal.)  $8.04 \times 10^3$ .
  - Item E: 70,180,000. What does it equal? (Signal.)  $7.018 \times 10^7$ .

## Exercise 2

### ALGEBRA TRANSLATION

#### Combination Symbols

##### — Textbook practice —

- a. Open your textbook to lesson 92, part 1. ✓
- (Teacher reference:)

- ◆ If you had at least \$103,  
you had  $\geq$  \$103.
- ◆ If you had a minimum of 7 pets,  
you had  $\geq$  7 pets.

- b. The box shows expressions that mean the same as **more than or equal to**.
- The first expression is **at least**.
  - What's the expression? (Signal.) *At least*.
  - **At least** is the same as **more than or equal to**.
  - If you had at least \$103, you would have **\$103 or more than \$103**.
  - So you would use the symbol for **greater than or equal to**.
- c. The next expression that means **more than or equal to** is a **minimum of**.
- What's the expression? (Signal.) *A minimum of*.
  - If you had a minimum of 7 pets, you would have 7 pets or more than 7 pets.
- d. Remember the new wording, **at least** and a **minimum of**. For both, you write **greater than or equal to**.
- e. You're going to write a statement for each sentence.

- f. Sentence A: 4J is at least 60.
- Can 4J be 60? (Signal.) Yes.
  - Can 4J be more than 60? (Signal.) Yes.
  - Write the statement. ✓
  - (Write on the board:) [92:2A]

$$\mathbf{a.} \quad 4j \geq 60$$

- Here's what you should have.
  - Everybody, read the statement. (Signal.) *4J is greater than or equal to 60.*
- g. Sentence B: P is at most 54.
- Can P be 54? (Signal.) Yes.
  - Can P be more than 54? (Signal.) *No. P can be no more than 54.*
  - Write the statement. ✓
  - (Write on the board:) [92:2B]

$$\mathbf{b.} \quad p \leq 54$$

- Here's what you should have.
  - Everybody, read the statement. (Signal.) *P is less than or equal to 54.*
- h. Sentence C: The cost of the hats cannot exceed \$12.
- Can the hats cost \$12? (Signal.) Yes.
  - Can the hats cost more than \$12? (Signal.) *No.*
  - Write the statement. ✓
  - (Write on the board:) [92:2C]

$$\mathbf{c.} \quad h \leq 12$$

- Here's what you should have.
  - Everybody, read the statement. (Signal.) *H is less than or equal to 12.*
- i. Sentence D: Shoes cost at least \$45.
- Write the statement. ✓
  - (Write on the board:) [92:2D]

$$\mathbf{d.} \quad s \geq 45$$

- Here's what you should have.
  - Everybody, read the statement. (Signal.) *S is greater than or equal to 45.*
- j. Sentence E: Her savings did not exceed \$5 a week.
- Write the statement. ✓

- (Write on the board:) [92:2E]

$$\text{e. } s \leq 5$$

- Here's what you should have.
- Everybody, read the statement.  
(Signal.) *S is less than or equal to 5.*
- k. Sentence F: Roberta had a minimum of 3 appointments.
- Write the statement. ✓
- (Write on the board:) [92:2F]

$$\text{f. } R \geq 3$$

- Here's what you should have.
- Everybody, read the statement.  
(Signal.) *R is greater than or equal to 3.*

### Exercise 3

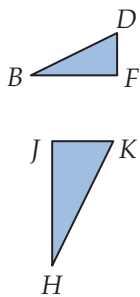
#### SIMILAR TRIANGLES

##### Corresponding Sides

###### — Textbook practice —

- a. Find part 2. ✓
- (Teacher reference:)

- ◆ These are similar triangles, but they are not oriented the same way.
- ◆ You have to figure out the corresponding sides.
- ◆ First find the longest side of each triangle.
- ◆ Then find the shortest side of each triangle.



- These are similar triangles, but they are not oriented the same way.
- You have to figure out the corresponding sides.
- The simplest way to do that is to first find the longest side of each triangle. Then find the shortest side of each triangle.
- b. Touch the longest side of each triangle. ✓
- You should be touching sides BD and HK.
- c. Touch the shortest side of each triangle. ✓
- You should be touching sides DF and KJ.

- d. Touch the last pair of corresponding sides. Those are the middle length sides. ✓
- You should be touching BF and JH.

###### — Textbook practice —

- a. Find part 3 of your textbook. ✓
- b. Item A. Touch the side with the question mark. ✓
- Is that the longest side, the shortest side, or the middle-length side? (Signal.) The shortest side.
- Touch the corresponding side in the other triangle. ✓
- Write the fraction for those sides. Then complete the equation with the pair of corresponding sides that have numbers in both triangles. Pencils down when you've done that much.  
(Observe students and give feedback.)
- (Write on the board:) [92:3A]

$$\text{a. } \frac{XZ}{3} = \frac{16}{5}$$

- Here's the equation you should have:  
 $XZ \text{ over } 3 = 16 \text{ over } 5.$   
You'll solve the equation later.
- c. Item B. Touch the side with the question mark and the corresponding side. ✓
- Are you touching the longest sides, the middle-length sides, or the shortest sides? (Signal.) *The longest sides.*
- Skip 3 lines. Write the fraction for that pair of sides. Then complete the equation with the fraction for the corresponding sides that have numbers. Pencils down when you've done that much.  
(Observe students and give feedback.)
- (Write on the board:) [92:3B]

$$\text{b. } \frac{PQ}{13} = \frac{4}{5}$$

- Here's the equation you should have:  
 $PQ/13 = 4/5.$

- d. Write equations for items C and D. Don't solve the problems. Just write the equations. Leave space. Pencils down when you've done that much. (Observe students and give feedback.)
- e. Check your work. Read the equation for each item.
- Item C. (Signal.)  $RP/18 = 10/12$ . (Accept  $PR/18 = 10/12$ .)
  - Item D. (Signal.)  $YZ/24 = 14/18$ . (Accept  $ZY/24 = 14/18$ .)
- f. Solve each problem. The unit name is centimeters. Pencils down when you're finished. (Observe students and give feedback.)
- g. Check your work.
- Item A. You figured out XZ. Everybody, what does XZ equal? (Signal.) *9 and  $3/5$  centimeters.*  
Yes, 9 and  $3/5$  centimeters.
  - Item B. You figured out PQ. Everybody, what does PQ equal? (Signal.) *10 and  $2/5$  centimeters.*  
Yes, 10 and  $2/5$  centimeters.
  - Item C. You figured out RP. Everybody, what does RP equal? (Signal.) *15 centimeters.*  
Yes, 15 centimeters.
  - Item D. You figured out YZ. Everybody, what does YZ equal? (Signal.) *18 and  $2/3$  centimeters.*  
Yes, 18 and  $2/3$  centimeters.
- c. Triangle A. Does the problem give the hypotenuse? (Signal.) *Yes.*  
So what do you solve for? (Signal.) *X.*
- Triangle B. Does the problem give the hypotenuse? (Signal.) *No.*  
So what do you solve for? (Signal.) *H.*
  - Triangle C. Does the problem give the hypotenuse? (Signal.) *Yes.*  
So what do you solve for? (Signal.) *X.*
  - Triangle D. Does the problem give the hypotenuse? (Signal.) *No.*  
So what do you solve for? (Signal.) *H.*
- (Repeat step c until firm.)
- d. Work the problems. Show the answer as a whole number or a square-root number. You don't need a calculator. Refer to the square-root table if you need to. It's shown on the inside back cover of your textbook. Pencils down when you're finished. (Observe students and give feedback.)
- e. Check your work.
- f. Problem A. Did you figure out X or H? (Signal.) *X.*
- What does  $X^2$  equal? (Signal.)  $65.$
  - What does X equal? (Signal.)  $\sqrt{65}.$
- g. Problem B. Did you figure out X or H? (Signal.) *H.*
- What does  $H^2$  equal? (Signal.)  $109.$
  - What does H equal? (Signal.)  $\sqrt{109}.$
- h. Problem C. Did you figure out X or H? (Signal.) *X.*
- What does  $X^2$  equal? (Signal.)  $400.$
  - What does X equal? (Signal.)  $20.$
- i. Problem D. Did you figure out X or H? (Signal.) *H.*
- What does  $H^2$  equal? (Signal.)  $50.$
  - What does H equal? (Signal.)  $\sqrt{50}.$

#### Exercise 4

### PYTHAGORAS

#### Solve for $x$ or $h$

##### — Textbook practice —

- a. Find part 4.  $\sqrt{\quad}$
- b. Each triangle shows the length of 2 sides. You'll figure out the length of the missing side. If the missing side is not the hypotenuse, call it X. Remember, if the missing side is opposite the right angle, it's the hypotenuse.

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**Exercise 5**


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**PROBABILITY**


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**Textbook practice**


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- a. Find part 5.  $\sqrt{\quad}$ 
  - Some of these problems ask about the trials, and some ask about the object.
- b. Problem A: A spinner has 24 equal-sized parts. If a person takes 96 trials and the spinner lands on a part that is green 16 times, how many parts are probably green?
  - Does that problem ask about the object or the trials? (Signal.) *The object.*
- c. Problem B: A deck has 100 cards, each with a different name on it. Lisa draws cards until she has drawn the name **Ed** 4 times. About how many trials does she take?
  - Does that problem ask about the object or the trials? (Signal.) *The trials.*
- d. Problem C: A game-show wheel has 18 prize spaces. The wheel is spun 190 times and lands on a prize 90 times. How many spaces would you estimate are on the game-show wheel?
  - Does that problem ask about the object or the trials? (Signal.) *The object.*
- e. Problem D: A parking lot attendant collects keys to 112 cars. 42 of the cars are red. The parking lot attendant takes trials by randomly selecting keys to the cars. If the attendant takes 40 trials, on how many of those trials would you expect him to draw a key to a red car?
  - Does that problem ask about the object or the trials? (Signal.) *The trials.*
- f. Problem E: A deck contains 30 cards. Each card has a number or a picture on it. Lily takes 24 trials drawing a card, then replacing it in the deck. On 16 of those trials, the card has a picture on it. On how many cards in the deck would you expect there to be a picture?
  - Does that problem ask about the object or the trials? (Signal.) *The object.*
- g. Work problem A. Pencils down when you're finished. (Observe students and give feedback.)
  - (Write on the board:) [92:5A]

a.  $\frac{g}{24} = \frac{16}{96}$

  - Here's the equation you start with. You solved for the number of green parts the spinner probably has. What's the answer? (Signal.) *4 [green] parts.*
- h. Work problem B. Pencils down when you're finished. (Observe students and give feedback.)
  - Check your work. You solved for the total number of trials Lisa takes. What's the answer? (Signal.) *[About] 400 trials.*
- i. Work problem C. Pencils down when you're finished. (Observe students and give feedback.)
  - Check your work. You solved for the total number of spaces on a game-show wheel. What's the answer? (Signal.) *38 spaces.*
- j. Work problem D. Pencils down when you're finished. (Observe students and give feedback.)
  - Check your work. You solved for the number of trials you'd expect to draw a key to a red car. What's the answer? (Signal.) *15 trials.*
- k. Work problem E. Pencils down when you're finished. (Observe students and give feedback.)
  - Check your work. You solved for the number of cards with a picture. What's the answer? (Signal.) *20 cards.*

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**Exercise 6**


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**INDEPENDENT WORK**

**Assign Independent Work: textbook parts 6–15 and workbook part 3.**