

Place it Right

- Goals**
- Recognize that equality of moments is represented by a balanced mobile.
 - Compute the moment of an object.

Notes The *moment* of an object is the product of its weight and its distance from the balance point. Point out that the farther a mass is suspended from the hanger, the greater its moment will be. Students might realize, when working through the questions, that when there is only one mass on one side, it is likely to be the heaviest mass, since it must balance two or more lighter masses on the other side.

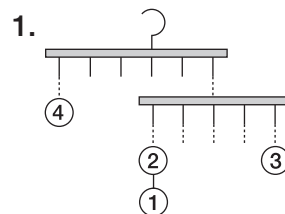
Solutions to all problems in this set appear on page 47.

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Questions to Ask

- Why does A balance? (The distance times the mass to the left of the hanger [$3 \times 1 + 1 \times 6$, or 9] is equal to the distance times the mass to the right of the hanger [$1 \times 3 + 3 \times 2$, or 9].)
- On B, the small mobile within the larger one is a mini-mobile. Does it balance? (yes) How? ($2 \times 1 = 1 \times 2$)
- What must you do to find the moment of the masses on the left of the hanger? (Multiply 3, the weight of the mini-mobile, times 2, its distance from the hanger.) What is the moment? (6)

Solutions

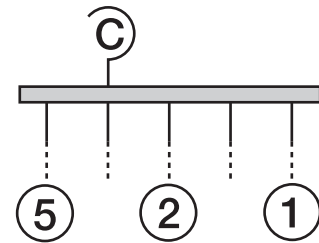
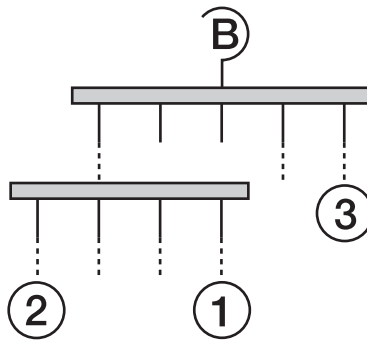
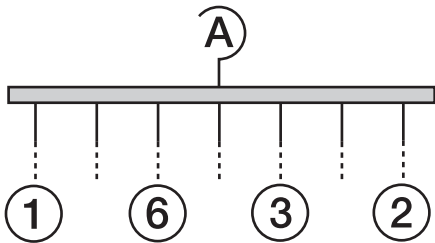


$$\begin{aligned}
 2. \quad 3 \times 4 &= 2 \times [2 + 1 + 3] \\
 12 &= 2 \times 6 \\
 12 &= 12
 \end{aligned}$$

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The circles represent masses. The number in each circle tells the weight of that mass. The lines on the bars show how far a mass is from the hanger.

These mobiles are balanced.



$$3 \times 1 + 1 \times 6 = 1 \times 3 + 3 \times 2$$

$$3 + 6 = 3 + 6$$

$$9 = 9$$

$$2 \times [1 + 2] = 2 \times 3$$

$$2 \times 3 = 6$$

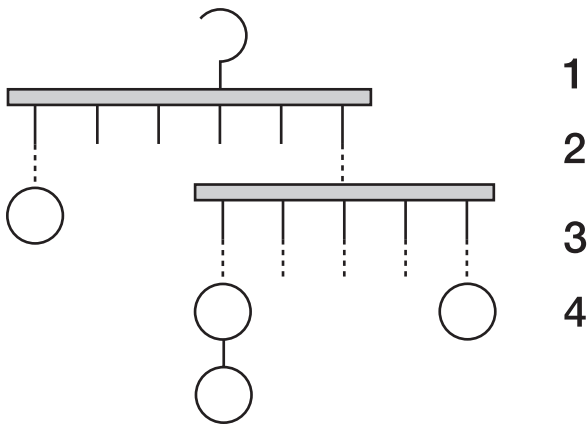
$$6 = 6$$

$$1 \times 5 = 1 \times 2 + 3 \times 1$$

$$5 = 2 + 3$$

$$5 = 5$$

1. Write the numbers in the circles so that the mobile will balance.



2. Use equations to verify that the mobile balances.
