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Unit 6, Lesson 1: Tape Diagrams and Equations

1. Here is an equation: $x + 4 = 17$

    a. Draw a tape diagram to represent the equation.

    b. Which part of the diagram shows the quantity x? What about 4? What about 17?

    c. How does the diagram show that $x + 4$ has the same value as 17?

2. Diego is trying to find the value of x in $5 \cdot x = 35$. He draws this diagram but is not certain how to proceed.

X	X	X	X	X
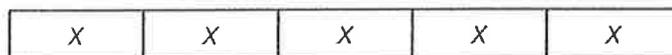
    a. Complete the tape diagram so it represents the equation $5 \cdot x = 35$.

    b. Find the value of x.

3. For each equation, draw a tape diagram and find the unknown value.

    a. $x + 9 = 16$ b. $4 \cdot x = 28$

4. Match each equation to one of the two tape diagrams.

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A

x	x	x

9

B

x	3

9
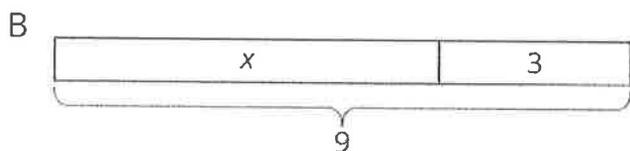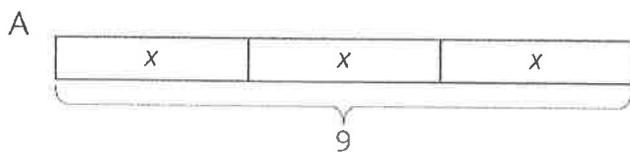
a. $x + 3 = 9$
b. $3 \cdot x = 9$
c. $9 = 3 \cdot x$
d. $3 + x = 9$
e. $x = 9 - 3$
f. $x = 9 \div 3$
g. $x + x + x = 9$

5. A shopper paid $2.52 for 4.5 pounds of potatoes, $7.75 for 2.5 pounds of broccoli, and $2.45 for 2.5 pounds of pears. What is the unit price of each item she bought? Show your reasoning.

(from Unit 5, Lesson 13)

6. A sports drink bottle contains 16.9 fluid ounces. Andre drank 80% of the bottle. How many fluid ounces did Andre drink? Show your reasoning.

(from Unit 3, Lesson 14)

7. The daily recommended allowance of calcium for a sixth grader is 1,200 mg. One cup of milk has 25% of the recommended daily allowance of calcium. How many milligrams of calcium are in a cup of milk? If you get stuck, consider using the double number line.

calcium (mg)   0   1200

                0   100%
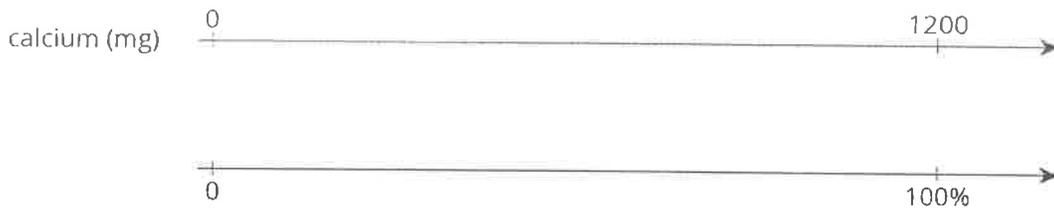
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Unit 6, Lesson 2: Truth and Equations

1. Select **all** the true equations.

   A. $5 + 0 = 0$

   B. $15 \cdot 0 = 0$

   C. $1.4 + 2.7 = 4.1$

   D. $\frac{2}{3} \cdot \frac{5}{9} = \frac{7}{12}$

   E. $4\frac{2}{3} = 5 - \frac{1}{3}$

2. Mai's water bottle had 24 ounces in it. After she drank x ounces of water, there were 10 ounces left. Select **all** the equations that represent this situation.

   A. $24 \div 10 = x$

   B. $24 + 10 = x$

   C. $24 - 10 = x$

   D. $x + 10 = 24$

   E. $10x = 24$

3. Priya has 5 pencils, each x inches in length. When she lines up the pencils end to end, they measure 34.5 inches. Select **all** the equations that represent this situation.

   A. $5 + x = 34.5$

   B. $5x = 34.5$

   C. $34.5 \div 5 = x$

   D. $34.5 - 5 = x$

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E. $x = (34.5) \cdot 5$

4. Match each equation with a solution from the list of values.

A. $2a = 4.6$ 1. $\frac{8}{5}$

B. $b + 2 = 4.6$
                                                       2. $1\frac{5}{8}$

C. $c \div 2 = 4.6$
                                                       3. 2.3

D. $d - 2 = 4.6$
                                                       4. 2.6

E. $e + \frac{3}{8} = 2$
                                                       5. 6.6

F. $\frac{1}{8}f = 3$
                                                       6. 9.2

G. $g \div \frac{8}{5} = 1$ 7. 24

5. The daily recommended allowance of vitamin C for a sixth grader is 45 mg. 1 orange has about 75% of the recommended daily allowance of vitamin C. How many milligrams are in 1 orange? If you get stuck, consider using the double number line.

vitamin C (mg)
```
        0                           45
        +----+----+----+----+---->
```
```
        0                          100%
        +----+----+----+----+---->
```

(from Unit 3, Lesson 11)

6. There are 90 kids in the band. 20% of the kids own their own instruments, and the rest rent them.

a. How many kids own their own instruments?

b. How many kids rent instruments?

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Unit 6, Lesson 3: Staying in Balance

1. Select **all** the equations that represent the hanger.
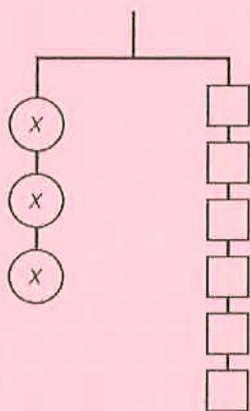

A. $x + x + x = 1 + 1 + 1 + 1 + 1 + 1$
B. $x \cdot x \cdot x = 6$
C. $3x = 6$
D. $x + 3 = 6$
E. $x \cdot x \cdot x = 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$

2. Write an equation to represent each hanger.

A   B   C   D
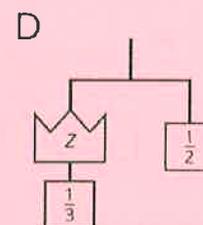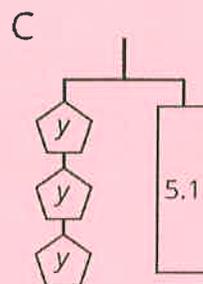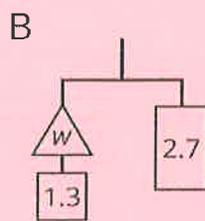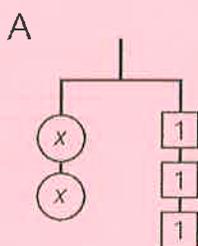
3. a. Write an equation to represent the hanger.

   b. Explain how to reason with the hanger to find the value of x.
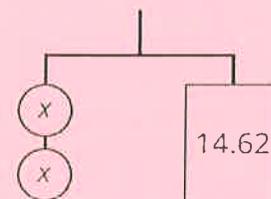
   c. Explain how to reason with the equation to find the value of x.

4. Andre says that x is 7 because he can move the two 1s with the x to the other side.

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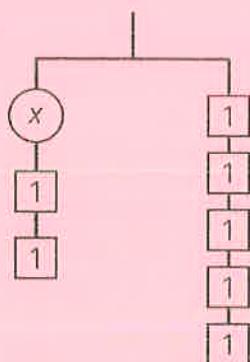
Do you agree with Andre? Explain your reasoning.

5. Match each equation to one of the diagrams.

   a. $12 - m = 4$
   b. $12 = 4m$
   c. $m - 4 = 12$
   d. $\frac{m}{4} = 12$
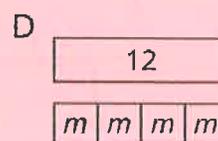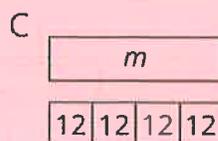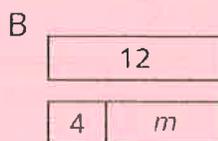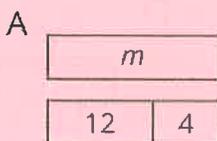
(from Unit 6, Lesson 1)

6. The area of a rectangle is 14 square units. It has side lengths a and b. Given the following values for a, find b.

1. $a = 2\frac{1}{3}$ 2. $a = 4\frac{1}{5}$ 3. $a = \frac{7}{6}$

(from Unit 4, Lesson 13)

7. Lin needs to save up $20 for a new game. How much money does she have if she has saved the following percentages of her goal. Explain your reasoning.

   a. 25%   b. 75%   c. 125%

(from Unit 3, Lesson 11)

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Unit 6, Lesson 4: Practice Solving Equations and Representing Situations with Equations

1. Select **all** the equations that describe each situation and then find the solution.

    a. Kiran's backpack weighs 3 pounds less than Clare's backpack. Clare's backpack weighs 14 pounds. How much does Kiran's backpack weigh?

        i. $x + 3 = 14$

        ii. $3x = 14$

        iii. $x = 14 - 3$

        iv. $x = 14 \div 3$

    b. Each notebook contains 60 sheets of paper. Andre has 5 notebooks. How many sheets of paper do Andre's notebooks contain?

        i. $y = 60 \div 5$

        ii. $y = 5 \cdot 60$

        iii. $\frac{y}{5} = 60$

        iv. $5y = 60$

2. Solve each equation.

    a. $2x = 5$

    b. $y + 1.8 = 14.7$

    c. $6 = \frac{1}{2}z$

    d. $3\frac{1}{4} = \frac{1}{2} + w$

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e. $2.5t = 10$

3. For each equation, draw a tape diagram that represents the equation.

   a. $3x = 18$

   b. $3 + x = 18$

   c. $17 - 6 = x$

   (from Unit 6, Lesson 1)

4. Find each product.

   a. $(21.2) \cdot (0.02)$ b. $(2.05) \cdot (0.004)$

   (from Unit 5, Lesson 8)

5. For a science experiment, students need to find 25% of 60 grams. Jada says, "I can find this by calculating $\frac{1}{4}$ of 60." Andre says, "25% of 60 means $\frac{25}{100} \cdot 60$." Lin says both of their methods work. Do you agree with Lin? Explain your reasoning.

   (from Unit 3, Lesson 13)