

# ALEKS® MSTEP 8th grade practice #1

1. The sum of two numbers is 42. One number is 2 times as large as the other. What are the numbers?

2. Solve for  $y$ .

$$3y - 8 = -20$$

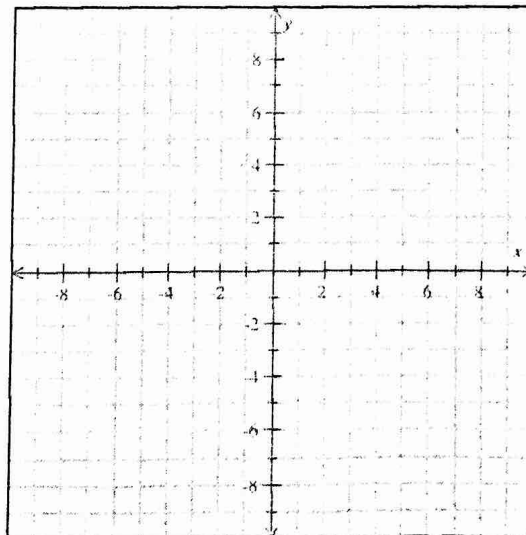
Simplify your answer as much as possible.

3. Solve the following system of equations.

$$6x + 9y = -3$$

$$6x + 5y = 9$$

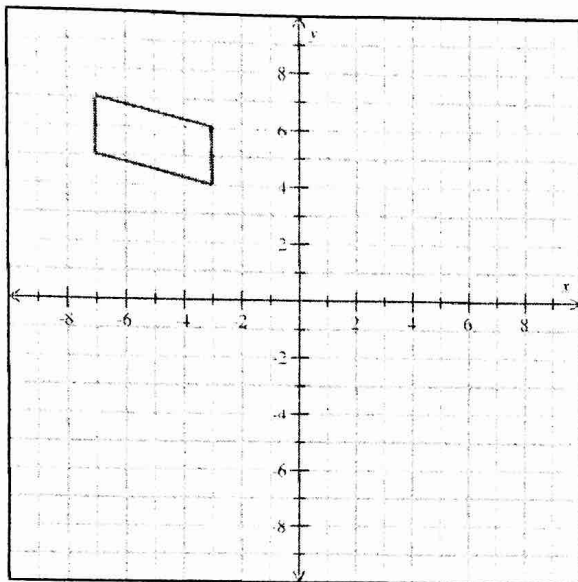
4. Graph the function  $g(x) = 2x - 7$ .



5. Rewrite using a single positive exponent.

$$\frac{7^5}{7}$$

6. Reflect the figure across the y-axis.  
Then answer the questions below.



Are the statements below true or false?

When the figure is reflected, the final angle measures are smaller than the original angle measures.

- True     False

When the figure is reflected:

If two sides are parallel to each other in the original figure, then those sides may *not* be parallel to each other in the final figure.

- True     False

When the figure is reflected, its side lengths stay the same.

- True     False

7. A swimming pool has to be drained for maintenance. The pool is shaped like a cylinder with a diameter of 8 m and a depth of 1.5 m. Suppose water is pumped out of the pool at a rate of  $19 \text{ m}^3$  per hour. If the pool starts completely full, how many hours will it take to empty the pool?

Use the value 3.14 for  $\pi$ , and round your answer to the nearest hour. Do not round any intermediate computations.

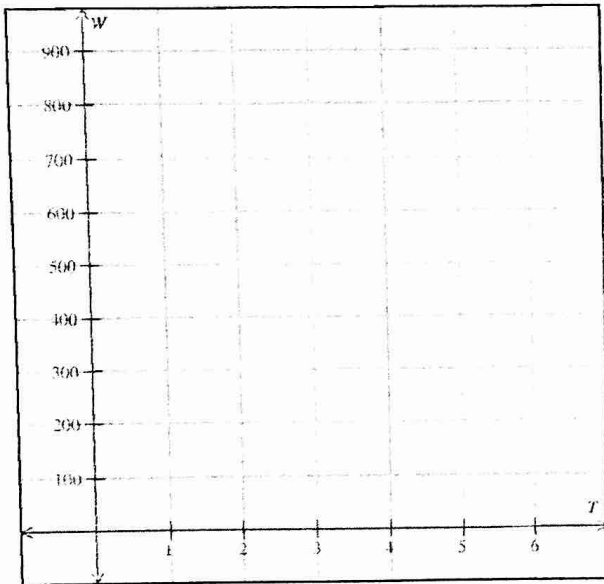
8. Solve for  $y$ .

$$23 + 18y = -21 + 14y$$

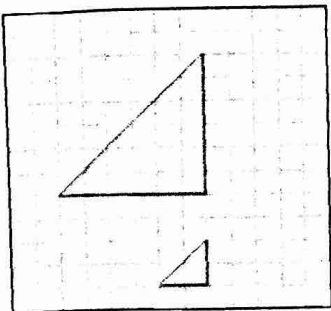
Simplify your answer as much as possible.

9. Owners of a recreation area are filling a small pond with water. They are adding water at a rate of 35 liters per minute. There are 700 liters in the pond to start.

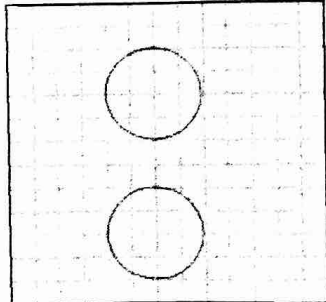
Let  $W$  represent the amount of water in the pond (in liters), and let  $T$  represent the number of minutes that water has been added. Write an equation relating  $W$  to  $T$ , and then graph your equation using the axes below.



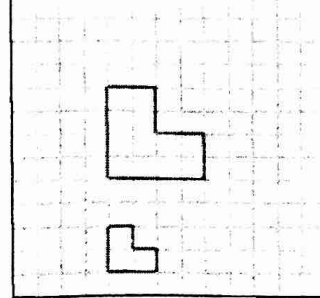
10. Which pairs of figures are congruent? Which pairs are similar?



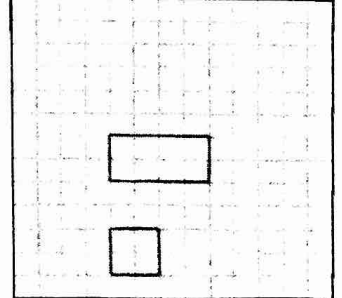
Congruent?  Yes  No  
 Similar?  Yes  No



Congruent?  Yes  No  
 Similar?  Yes  No



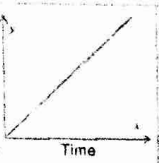
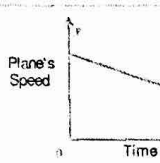
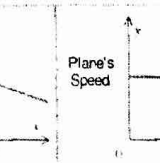
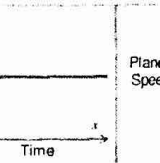
Congruent?  Yes  No  
 Similar?  Yes  No



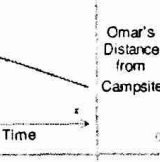
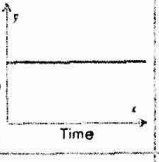
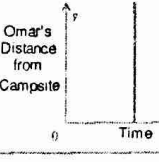

Congruent?  Yes  No  
 Similar?  Yes  No

11. For each scenario below, choose the best graph.

(a) A plane goes slower after landing.

|   |   |   |   |
|---|---|---|---|
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(b) Omar hikes away from his campsite.

|   |   |   |  |
|---|---|---|--|
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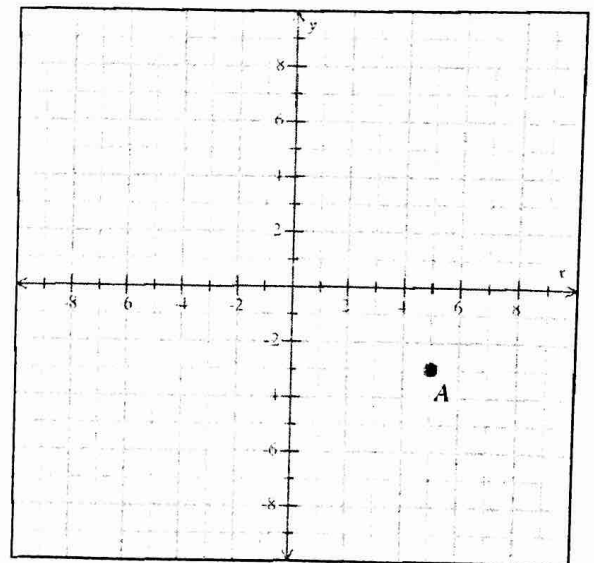
12. The point A is shown below.

Reflect A across the y-axis.

Then reflect the result across the x-axis.

Plot the final point.

**Important:** Only plot the final point in your answer.



13. Solve for  $w$ .

$$\frac{5}{3} = \frac{w-3}{4}$$

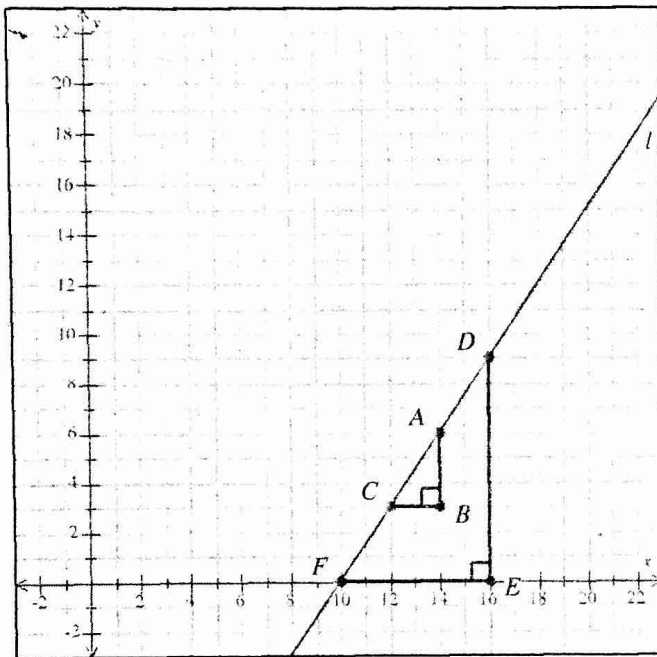
Simplify your answer as much as possible.

14. Line  $l$  is shown below.

Right triangles  $ABC$  and  $DEF$  are drawn to measure the slope of the line.

Find the run, rise, and slope given by each triangle.

Then, answer the questions.



Triangle  $ABC$ :

run: \_\_\_\_\_ rise: \_\_\_\_\_ slope: \_\_\_\_\_

Triangle  $DEF$ :

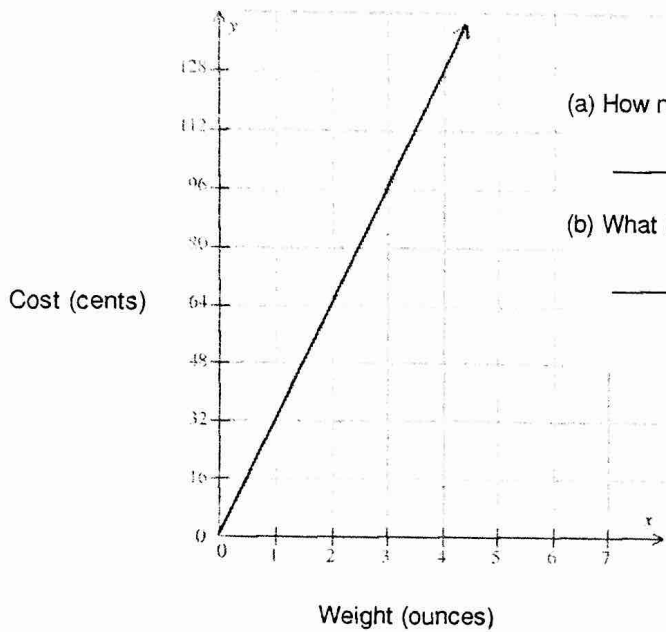
run: \_\_\_\_\_ rise: \_\_\_\_\_ slope: \_\_\_\_\_

Are the two slopes computed above equal? Why or why not?

- Yes. They are equal because the two triangles are similar.
- Yes. They are equal because the two triangles are congruent.
- No. They are not equal because the larger the triangle, the larger the slope.
- No. They are not equal because the smaller the triangle, the smaller the slope.

15. Justin buys cheese from the local farmer's market. The graph below shows the cheese cost (in cents) versus its weight (in ounces).

Use the graph to answer the questions.



(a) How much does the cost of the cheese increase for each ounce Justin buys?

\_\_\_\_\_ cents

(b) What is the slope of the line?

\_\_\_\_\_

17. Fill in the table using this function rule.

$$y = 22 - 3x$$

16. Rewrite using a single positive exponent.

$$7^{-3} \cdot 7^{-6}$$

| x | y                    |
|---|----------------------|
| 1 | <input type="text"/> |
| 2 | <input type="text"/> |
| 3 | <input type="text"/> |
| 5 | <input type="text"/> |

18. Let  $y$  represent the total cost of publishing a book (in dollars). Let  $x$  represent the number of copies of the book printed. Suppose that  $x$  and  $y$  are related by the equation  $10x + 1250 = y$ .

Answer the questions below.

Note that a change can be an increase or a decrease.

For an increase, use a positive number. For a decrease, use a negative number.

What is the change in the total cost for each book printed?

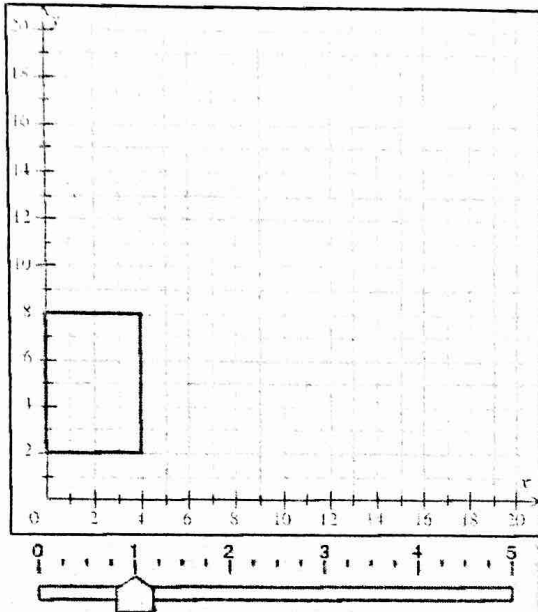
\$ \_\_\_\_\_

What is the cost to get started (before any books are printed)?

\$ \_\_\_\_\_

19. For the figure below, do a dilation centered at the origin with a scale factor of 2.

Then answer the questions.



(a) Find the following.

Area of original figure: \_\_\_\_\_ square units

Area of final figure: \_\_\_\_\_ square units

(b) Fill in the blank to make a true statement.

Area of final figure = \_\_\_\_\_  $\times$  Area of original figure

(c) True or False?

The original figure and the final figure are similar.

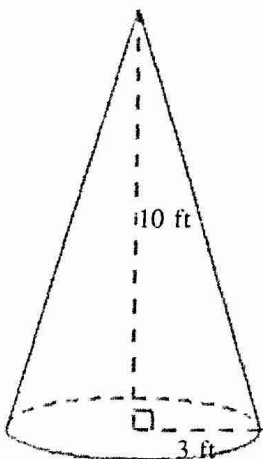
True       False

20. Calculate.

$$(3 \times 10^9)(1.3 \times 10^7)$$

Write your answer in scientific notation.

21. Find the volume of a cone with a base radius of 3 ft and a height of 10 ft. Write the exact volume in terms of  $\pi$ , and be sure to include the correct unit in your answer.



22. Write  $\frac{7}{16}$  as a decimal.

23. Use the distributive property to remove the parentheses. Simplify your answer as much as possible.

$$\frac{2}{5}(4 - 15w)$$