

## 2016 Mathematics Standards of Learning

8.1

1. Put the following numbers in ascending order.

$\frac{4}{5}$

1.29

$\sqrt{9}$

85%

$\frac{6}{4}$

2. Put the following numbers in descending order.

$1\frac{3}{8}$

$9.24 \times 10^{-2}$

$\pi$

$1.457 \times 10^5$

$-\sqrt{225}$

3. Place the following numbers on the number line.

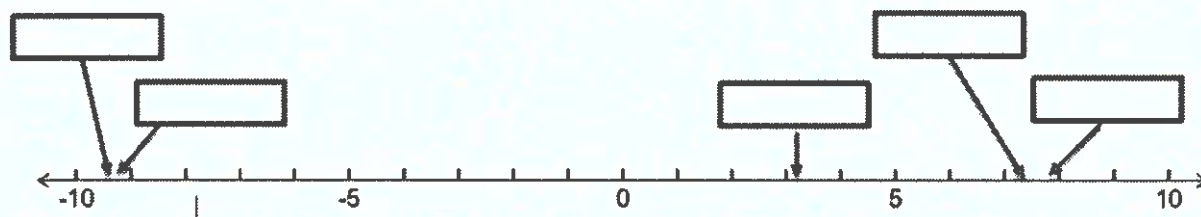
$\sqrt{56}$

$-9.2587\dots$

$\pi$

$7.99524\dots$

$-\sqrt{85}$



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4. Which set of numbers are listed in descending order?

- A.  $-66\%$ ,  $-0.45$ ,  $-\frac{1}{3}$ ,  $1.8$
- B.  $-66\%$ ,  $-\frac{1}{3}$ ,  $-0.45$ ,  $1.8$
- C.  $1.8$ ,  $-66\%$ ,  $-0.45$ ,  $-\frac{1}{3}$
- D.  $1.8$ ,  $-\frac{1}{3}$ ,  $-0.45$ ,  $-66\%$

5. Which number line correctly represents the irrational numbers listed below?

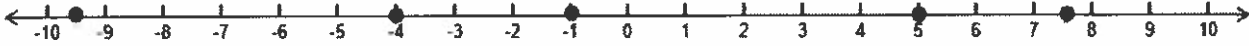
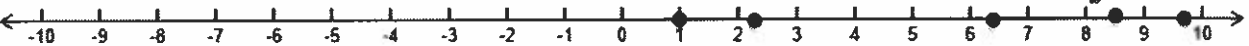

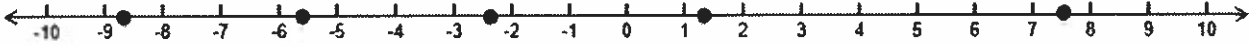
$-\sqrt{40}$

$\sqrt{75}$

$-\sqrt{95}$

$-\sqrt{10}$

$\sqrt{5}$

- A. 
- B. 
- C. 
- D. 

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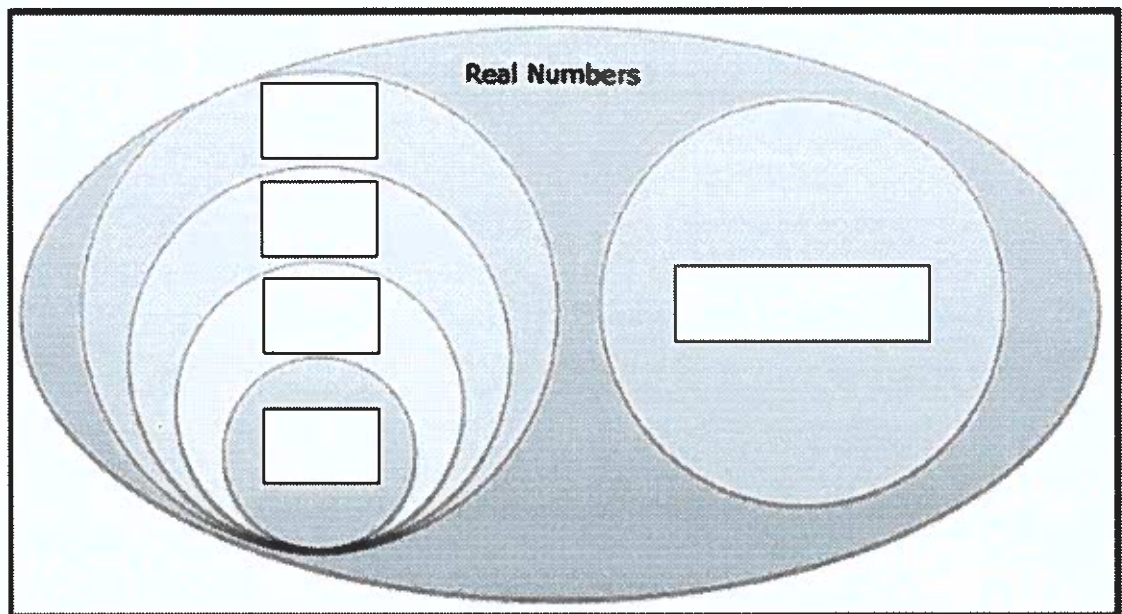
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# 2016 Mathematics Standards of Learning

8.2

- Write the following labels in the appropriate box to best represent the subsets of the real number system.

Rational Numbers
Whole Numbers
Irrational Numbers
Natural Numbers
Integers



- Fill in the blanks to make a true statement about  $0.33\overline{3}$ ... (choose from the choices below)

This  is a(n)  since it can be expressed as  $\frac{1}{3}$ .

repeating decimal

terminating decimal

irrational number

rational number

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3. Sort the following list of numbers into rational and irrational numbers.

0.21953    $\sqrt{12}$    0   4.285...    $-\sqrt{87}$     $-4\frac{2}{3}$    9.131313...    $\pi$

Rational Numbers	Irrational Numbers

4. Write the letter of each definition next to the corresponding subgroup of the real number system.

- |                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>____ Natural Numbers</p> <p>____ Whole Numbers</p> <p>____ Integers</p> <p>____ Rational Numbers</p> <p>____ Irrational Numbers</p> | <p>A. the set of whole numbers and their opposites <math>\{\dots -2, -1, 0, 1, 2, \dots\}</math></p> <p>B. the set of counting numbers and zero <math>\{0, 1, 2, 3, \dots\}</math></p> <p>C. the set of all nonrepeating, nonterminating decimals<br/> <math>\{\pi, 1.23233, \sqrt{2}\}</math></p> <p>D. the set of counting numbers <math>\{1, 2, 3, 4, \dots\}</math></p> <p>E. the set of all numbers that can be expressed as fraction in form <math>\frac{a}{b}</math>, where <math>a</math> and <math>b</math> are integers and <math>b</math> does not equal zero<br/> <math>\left\{2.44\bar{4}, 75\%, \frac{3}{7}, \sqrt{49}\right\}</math></p> |
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5. Identify which statement is false.

The product of two rational numbers is rational.

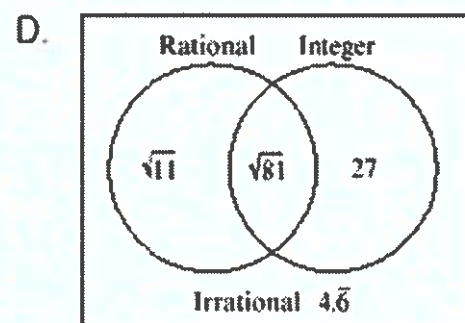
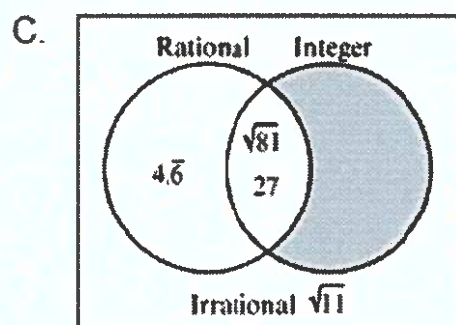
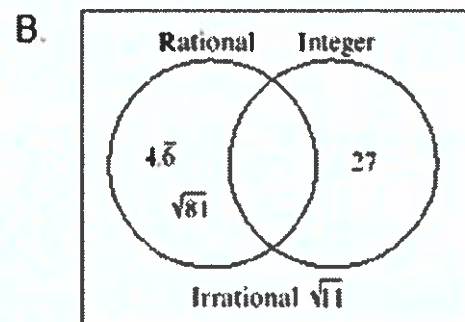
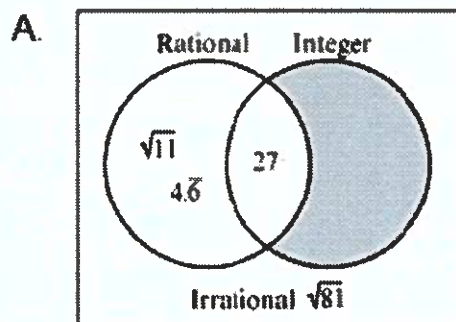
The sum of a rational number and an irrational number is irrational.

The sum of a rational number and an irrational number is rational.

The product of a nonzero rational number and an irrational number is irrational.

6. Which Venn diagram best represents the following sets of numbers?

$$\sqrt{81}, 27, 4.\bar{6}, \sqrt{11}$$



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7. Which of the following can be defined as an integer, but not a whole number?

A.  $-\frac{1}{3}$

B.  $-\sqrt{20}$

C.  $-\frac{20}{5}$

D.  $-13.1$

8. The number 3.7 is best described as –

A. a rational number

B. an integer

C. a whole number

D. an irrational number

9. Which is a true statement concerning the rational number  $\frac{2}{3}$ ?

A. This number can be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b \neq 0$ .

B. This number cannot be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b \neq 0$ .

C. This number can be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b = 0$ .

D. This number cannot be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b = 0$ .

10. Which of these is a rational number?

A.  $\sqrt{2}$

B.  $0.414114\dots$

C.  $\sqrt{5}$

D.  $-6.060606$

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2016 Mathematics Standards of Learning

8.3ab

1. The square root of 130 falls between which two consecutive numbers? Select two answers from the choices below.

-13

12

15

-11

-12

-15

11

2.  $\sqrt{300}$  falls between which two sets of consecutive numbers?

16 and 17

15 and 20

17 and 18

10 and 30

-10 and -30

299 and 301

-16 and -17

-17 and -18

3. The square root of 170 falls between which two consecutive whole numbers?

\_\_\_\_\_ and \_\_\_\_\_

4. Which of these best represents  $\sqrt{24}$ ? A number between –

- A. 4 and 5
- B. 5 and 6
- C. 6 and 7
- D. 8 and 9

5. Between which two consecutive numbers does  $-\sqrt{50}$  lie?

- A. -4 and -5
- B. -5 and -6
- C. -6 and -7
- D. -7 and -8

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6. What are the square roots of 121? Select two answers from the choices below.

-13

12

15

-11

-12

-15

11

7. Which best represents  $\sqrt{256}$  ?

- A. 4 and 64
- B. 8 and 32
- C. -16 and 16
- D. -18 and 18

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## 2016 Mathematics Standards of Learning

### 8.4

1. There were 350 apples on the tree in March. By September there were 420 apples on the tree. What was the percentage of change of apples on the tree? Round your answer to the nearest tenth.
2. A swim coach charges \$50 for each half-hour lesson.

Select the statements that correctly match this ratio.

She charges \$100 for each one hour lesson	She charges \$25 for each one hour lesson	She charges \$150 for each two hour lesson
She charges \$150 for each	She charges \$100 for each fifteen minute lesson	She charges \$150 for each hour and a half lesson

3. Liam puts \$800 in a savings account at an annual interest rate of 2%. If Liam does not withdraw or deposit any money, what is the interest that Liam will earn at the end of six months?
  - A. \$2
  - B. \$4
  - C. \$8
  - D. \$16
4. A soccer team won 11 games last year. This year they won 13 games. What was the percent increase in the number of games won?
  - A. 2%
  - B. 15.4%
  - C. 18.2%
  - D. 84.6%

**5. Brittany bought a dress that cost \$22.50. If the sales tax is 6.5%, how much tax did she pay?**

- A. \$1.46**
- B. \$1.47**
- C. \$23.96**
- D. \$23.97**

**6. Roy bought running shoes for \$44.98. If the sales tax is 7%, how much did he pay in total?**

- A. \$3.14**
- B. \$3.15**
- C. \$48.12**
- D. \$48.13**

# 2016 Mathematics Standards of Learning

8.14a

1. What is the value of  $\frac{1}{2}(x+8) - xy + z$  when  $x = 4$ ,  $y = -12$ , and  $z = -20$ ?

2. James evaluated the following algebraic expression.

$$\frac{|2x - y|}{\sqrt{5x + 2y}} \text{ when } x = 5 \text{ and } y = -2$$

His work is shown here.

$$\begin{aligned} & \frac{|2x - y|}{\sqrt{5x + 2y}} \\ & \frac{|2(5) - (-2)|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|2(5) - 2|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|10 - 2|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{|8|}{\sqrt{5(5) + 2(-2)}} \\ & \frac{8}{\sqrt{5(5) + 2(-2)}} \\ & \frac{8}{\sqrt{25 + 2(-2)}} \\ & \frac{8}{5 + 2(-2)} \\ & \frac{8}{5 + (-4)} \\ & \frac{8}{1} = 8 \end{aligned}$$

James made a mistake while evaluating this expression. Identify his mistake and rework the problem to obtain the correct answer.

3. What is the value of  $4n(n+2)^3$  when  $n = -8$ ?
- A. -2048
  - B. -384
  - C. 384
  - D. 2048
4. What is the value of  $p\sqrt{q-r}$  when  $p = 3$ ,  $q = 17$ , and  $r = 8$ ?
- A. 3
  - B. 9
  - C. 15
  - D. 27
5. What is the value of  $\frac{(k+4)^2-1}{k+7}$  when  $k = -2$ ?
- A. -7
  - B.  $\frac{1}{3}$
  - C.  $\frac{3}{5}$
  - D. 7

2016 Mathematics Standards of Learning

8.14b

1. Simplify the algebraic expression,  $\frac{1}{3}(5x+6) - \frac{2}{3}(6x-3)$ .

Answer: \_\_\_\_\_

2. Select all the expressions that would be equivalent to  $-3x+10$  when completely simplified.

$2 + \frac{-6x+16}{2}$	$-3(-x+3) - x + 1$
$\frac{1}{3}(-6x+15) - x - 5$	$2(x+4) - 5x + 2$

3. Simplify the algebraic expression,  $-2(x+7) - 3(4-2x)$ .

Answer: \_\_\_\_\_

4. Simplify the algebraic expression.

$$-9(-8p+12) - 6p$$

- A.  $-14p+3$
- B.  $64p+12$
- C.  $66p-108$
- D.  $126p-108$

5. Simplify the algebraic expression.  $\frac{3}{2}m - \frac{4}{5} - \frac{1}{2}m + \frac{6}{5}$

- A.  $m + \frac{2}{5}$
- B.  $2m+2$
- C.  $m+2$
- D.  $2m + \frac{2}{5}$





8.15ab

1. Identify all of the true statements.

All relations are functions, but not all functions are relations.

All functions are relations, but not all relations are functions.

In any set of ordered pairs, the second coordinate is called the domain.

A function is a relation between a set of inputs and a set of outputs with the property that each input is related to exactly one output

2. The table defines a function.

Changes in Joshua's Height Per Year				
Year	2002	2003	2004	2005
Change in height (inches)	2.5	2.25	1.5	0.75

What is the domain of the function?

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3. Complete the function table below. Then, list all of the domain and range values.

$$y = x^2 + 1$$

x	y
-1	
	1
2	
	10

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

4. Does the following relation represent a function?

$\{(1, 4), (2, 8), (1, 12), (3, 16)\}$

YES NO (circle one)

Explain your reasoning. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

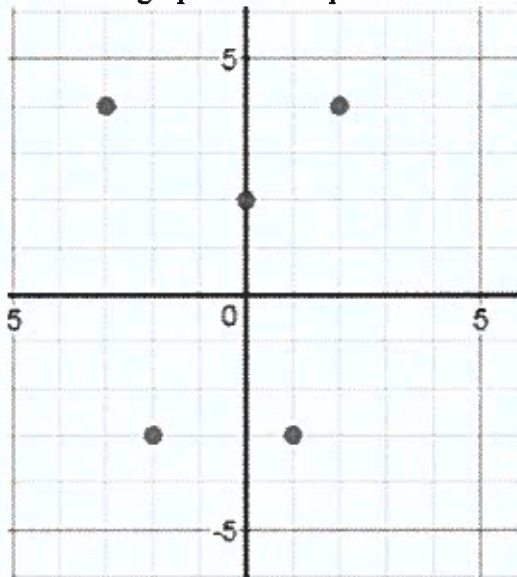
5. Does the following relation represent a function?

x	y
-2	-5
0	1
5	-5
9	6

YES NO (circle one)

Explain your reasoning. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

6. Does the graph below represent a function? YES NO (circle one)



Explain your reasoning for your answer. \_\_\_\_\_

7. Marissa used the set of ordered pairs below to graph a relation.

$$\{(3, 4), (2, 3), (2, 0), (4, 2), (3, 6)\}$$

What is the domain of the relation?

- A.  $\{0, 2, 3, 4, 6\}$
  - B.  $\{2, 3, 4\}$
  - C.  $\{0, 2, 3, 4\}$
  - D.  $\{0, 3, 6\}$
8. In the linear equation shown, which variable would represent the output (range) values?

$$y = mx + b$$

- A.  $y$
- B.  $m$
- C.  $x$
- D.  $b$

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9. Alex created a table to represent the function  $y = 2x + 4$ . What is the range for this table of values?

$x$	$y$
-2	0
0	4
2	8
4	12

10. Which of the following does NOT represent a function?

A.

$x$	$y$
-2	1
3	4
0	2
1	-3
-1	0

B.

$x$	$y$
3	-1
0	2
-1	4
2	3
1	1

C.

$x$	$y$
-1	5
2	2
5	2
3	-6
2	-4

D.

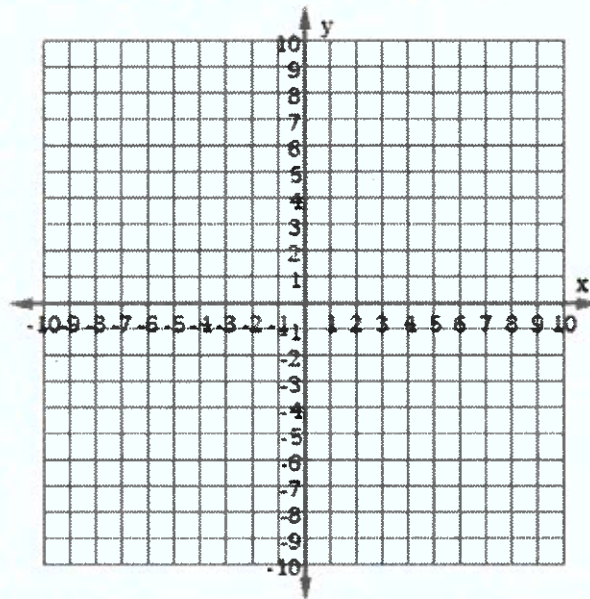
$x$	$y$
-2	4
3	-5
1	2
-3	4
0	1



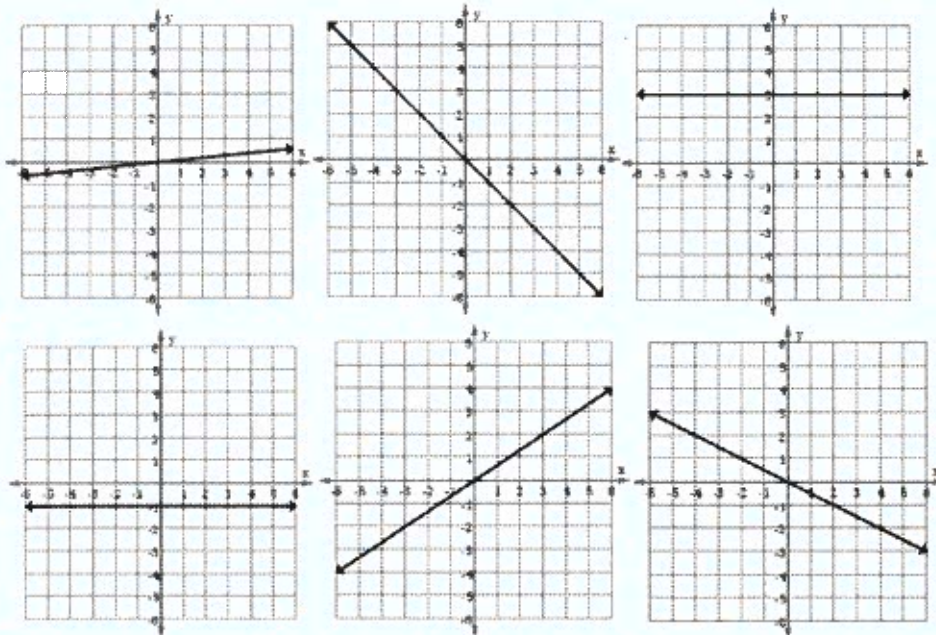
# 2016 Mathematics Standards of Learning

8.16a

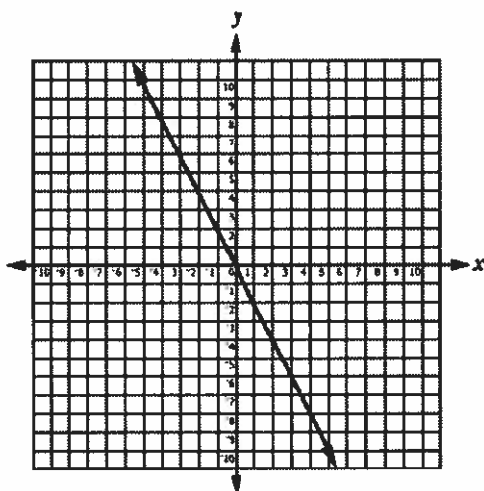
1. Draw a sketch of a line that has a slope of zero and describe how you know the slope is zero.



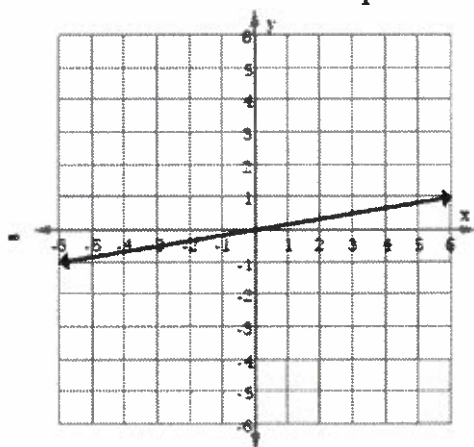
2. Select the two graphs with a negative slope.



3. What is true about the equation for the graph shown?

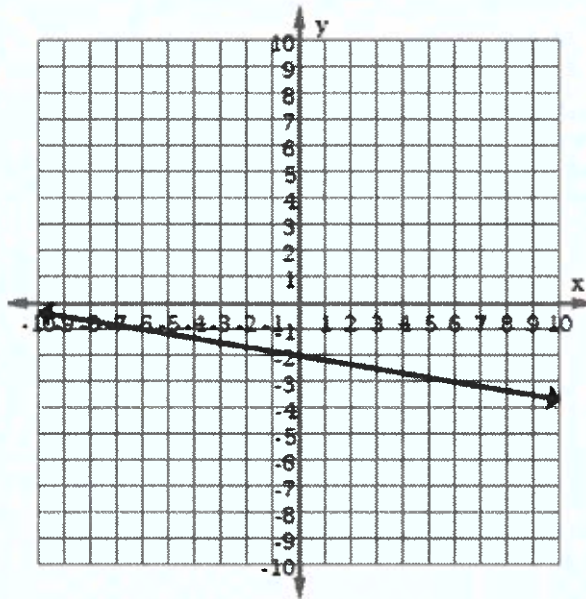


- A. It has a slope of -2.
  - B. It has a slope of -1.
  - C. It has a slope of 0.
  - D. It has a slope of 2.
4. What is true about the slope of the line graphed?



- A. The slope is positive.
- B. The slope is negative
- C. The slope is zero.
- D. The slope cannot be determined.

5. Which of the following statements is true about the line graphed below?



- A. The slope of the line is positive because the line is increasing from left to right.
- B. The slope of the line is positive because the line is decreasing from left to right.
- C. The slope of the line is negative because the line is increasing from left to right.
- D. The slope of the line is negative because the line is decreasing from left to right.





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8.16b

1. The table of values below represents a linear relationship.

$x$	$y$
-4	6
0	3
4	0

What is the slope and  $y$ -intercept for this line?

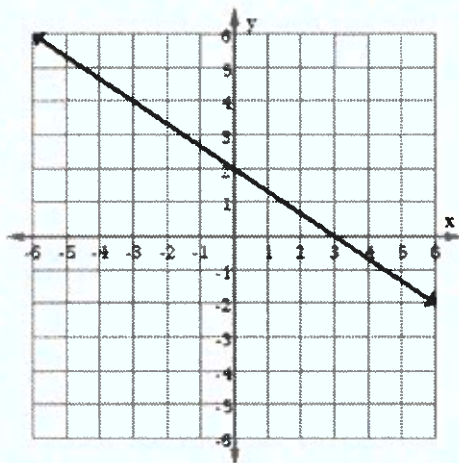
slope \_\_\_\_\_  $y$ -intercept \_\_\_\_\_

2. The equation  $y = -4x - 10$  represents a linear relationship.

What is the slope and  $y$ -intercept for this line?

slope \_\_\_\_\_  $y$ -intercept \_\_\_\_\_

3. Choose two true statements about the slope and  $y$ -intercept of the linear function shown.



The slope is  $\frac{2}{3}$ .

The slope is  $\frac{3}{2}$ .

The slope is  $-\frac{2}{3}$ .

The slope is  $-\frac{3}{2}$ .

The  $y$ -intercept is 2.

The  $y$ -intercept is 3.

The  $y$ -intercept is -2.

The  $y$ -intercept is -3.



4. Which is an equation for a line with a slope of -4 and a y-intercept of 5?

A.  $y = 5x - 4$

B.  $y = -4x + 5$

C.  $y = -\frac{4}{5}x$

D.  $y = -\frac{5}{4}x$

5. Which table of values represents a line with a slope of -1 and a y-intercept of 4?

A.

$x$	$y$
-1	-5
0	-1
1	-3

B.

$x$	$y$
-4	8
0	4
4	0

C.

$x$	$y$
-1	0
0	-4
1	-8

D.

$x$	$y$
-4	0
0	4
4	8

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8.16c

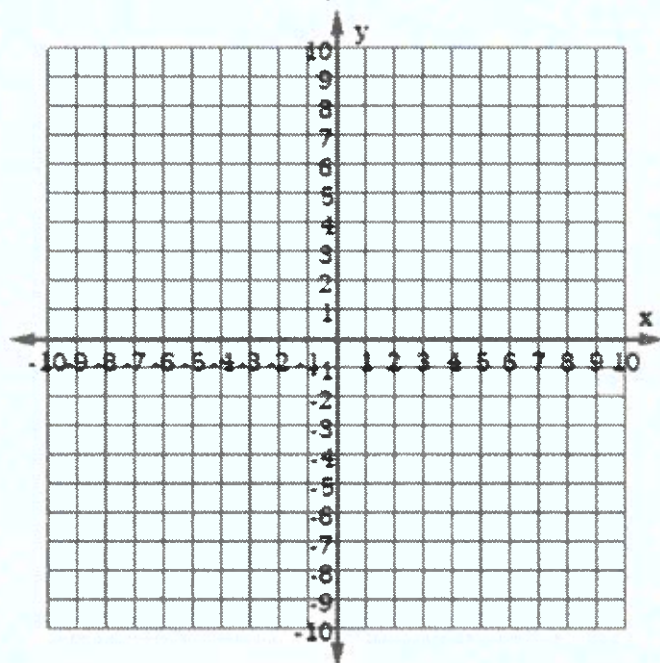
1. Pizza Pies charges \$12 for a medium pizza and an additional \$0.50 for each topping. Write an equation to represent the total cost,  $C$ , of a medium pizza with  $t$  toppings. Then identify the independent and dependent variables in this situation.
2. Which two scenarios correctly identify the independent variable?
  - In a daycare the number of kids determines the number of teachers needed. The number of teachers is the independent variable.
  - The amount of money Jerry earns depends on the number of lawns he mows. The number of lawns is the independent variable.
  - The amount of flour Casey has determines the number of cookies she can make. The amount of flour is the independent variable.
  - The number of bows Sarah can make depends on how much ribbon she has. The number of bows Sarah makes is the independent variable.
  - The amount of grass seed needed depends on the size of the yard in square feet the grass seed is the independent variable.
3. Suzanne is starting to babysit to earn extra money. She is charging \$15 for each hour that she babysits. What represents the independent variable in this situation?
  - A. The total amount charged for babysitting
  - B. The rate she is paid per hour
  - C. The number of hours she babysits
  - D. The number of children she babysits
4. The total cost,  $t$ , for frozen yogurt depends on the weight,  $w$ , in ounces. If Freddy's Frozen Yogurt Shop uses the equation  $t = 0.34w + 2$  to determine the cost of yogurt, which represents the dependent variable in this situation?
  - A. 0.34
  - B.  $t$
  - C. 2
  - D.  $w$



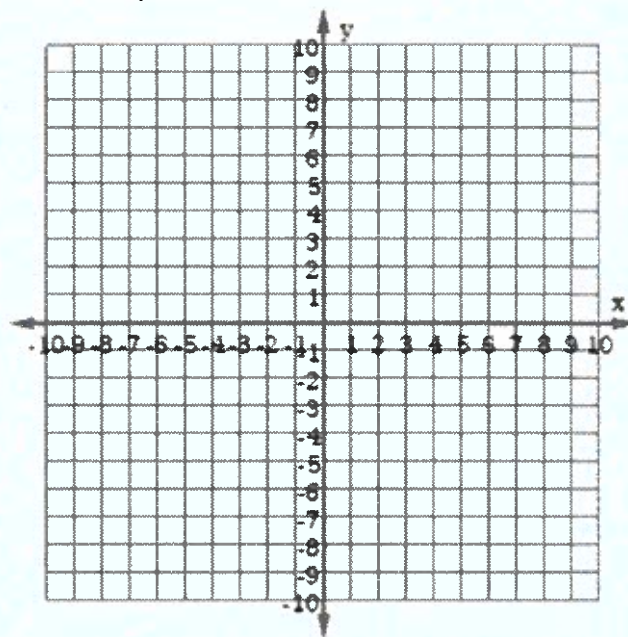
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8.16d

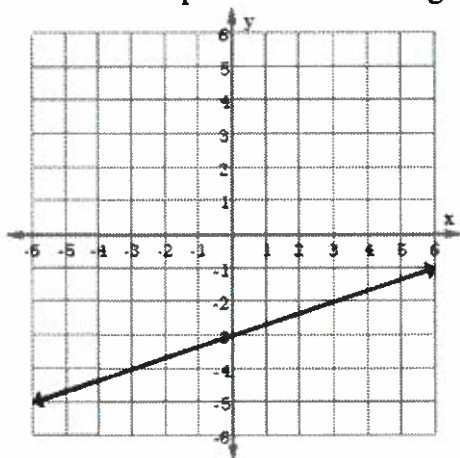
1. Graph the equation  $y = \frac{3}{4}x - 1$ .



2. Plot three points that lie on the line  $y = -3x + 2$ .

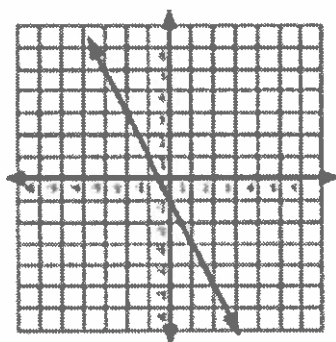


3. What is the equation for the line graphed below?

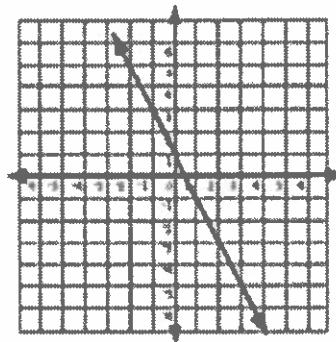


4. Which graph corresponds to  $y = -2x - 1$ ?

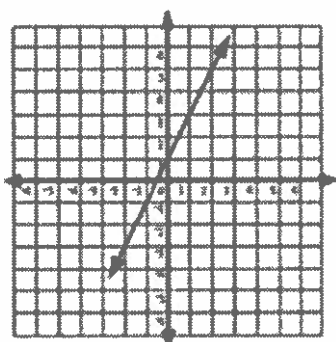
**Graph A**



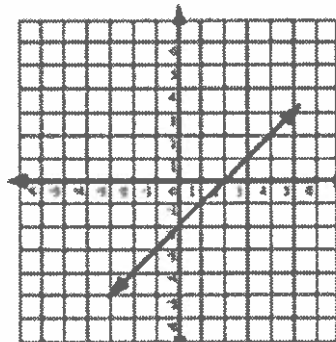
**Graph B**



**Graph C**

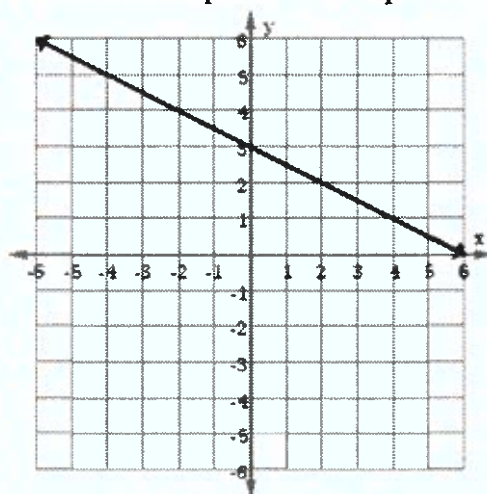


**Graph D**



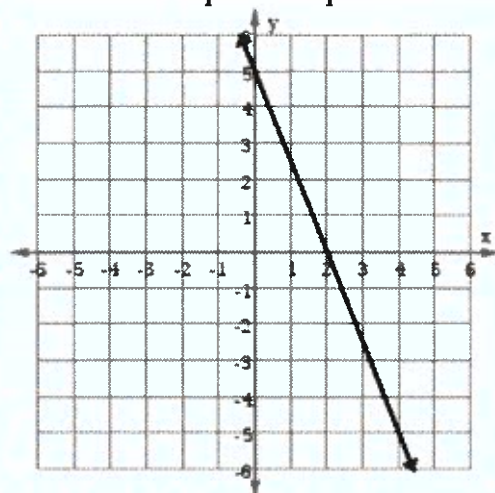


5. Which linear equation best represents the graph below?



- A.  $y = -\frac{1}{2}x + 2$
- B.  $y = -2x + 2$
- C.  $y = -\frac{1}{2}x + 3$
- D.  $y = -2x + 3$

6. Which linear equation represents the same relationship shown in the graph below?



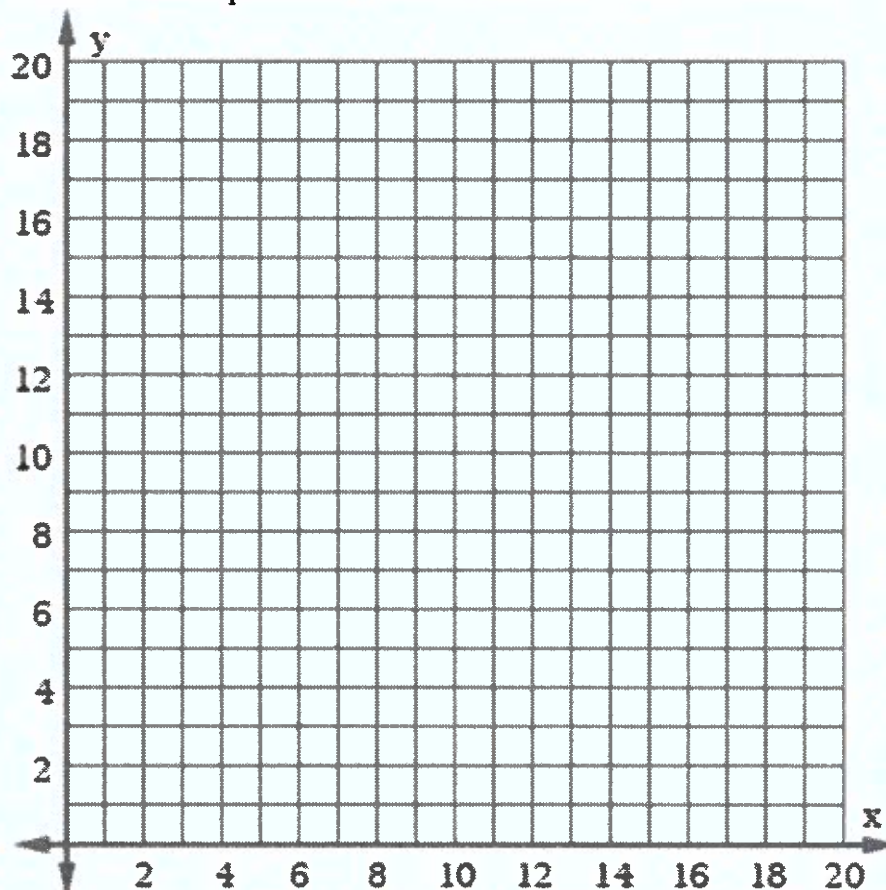
- A.  $y = -\frac{2}{5}x + 2$
- B.  $y = -\frac{2}{5}x + 5$
- C.  $y = -\frac{5}{2}x + 2$
- D.  $y = -\frac{5}{2}x + 5$



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8.16e

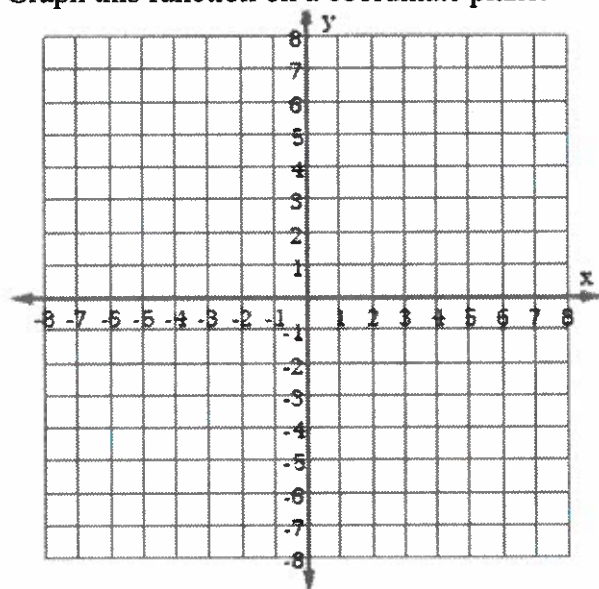
1. Josie is saving money to purchase a new pair of shoes. She has already saved \$5 and will earn \$0.50 for each chore she completes. Graph the relationship between number of chores Josie completes and the total amount she will have saved.



What part of Josie's scenario represents the slope of the line you graphed?

What part of Josie's scenario represents the  $y$ -intercept of the line you graphed?

2. A linear function has a slope of 4 and a y-intercept of 3.
- Write an equation to represent this function
  - Create a scenario to represent this function.
  - Make a table of values with at least 3 ordered pairs that represents this function.
  - Graph this function on a coordinate plane.

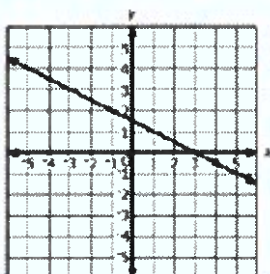


3. Which graph represents the same linear relationship shown in the table below?

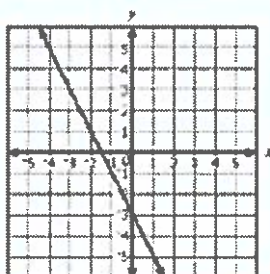
$x$	$y$
-1	-5
1	-1
2	1
4	5

# 2016 Mathematics Standards of Learning

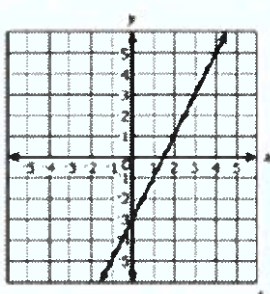
**Graph A**



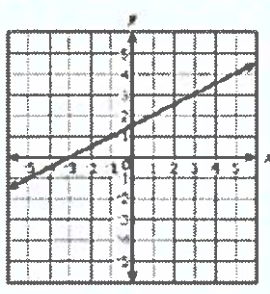
**Graph B**



**Graph C**



**Graph D**



4. Which equation represents the same linear function in the table below?

$x$	$y$
1	7
3	15
5	23

- A.  $y = -x + 7$
- B.  $y = 4x + 3$
- C.  $y = 8x + 7$
- D.  $y = x + 8$



5. Which table of values is represented by  $y = 3x - 2$  ?

A.

$x$	$y$
1	1
2	-1
3	-3

B.

$x$	$y$
1	1
2	4
3	7

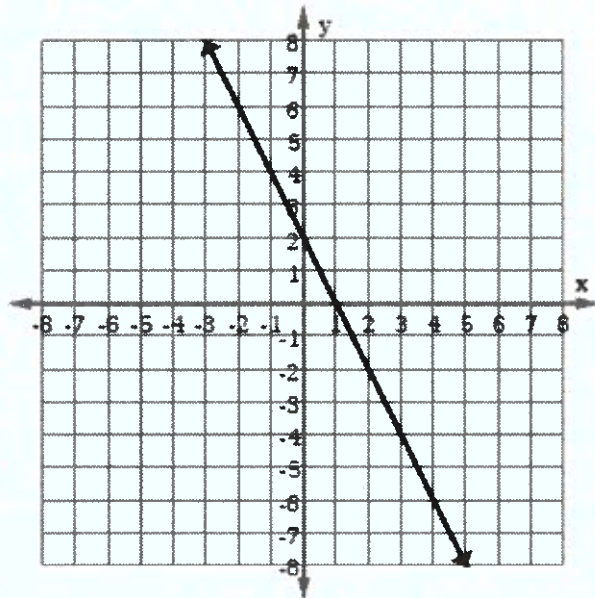
C.

$x$	$y$
4	10
6	7
8	4

D.

$x$	$y$
4	10
6	12
8	14

6. The graph represents the same relationship as which table of ordered pairs?



A.

$x$	$y$
8	14
9	16
10	18

B.

$x$	$y$
8	-18
9	-20
10	-22

C.

$x$	$y$
-10	18
-9	16
-8	14

D.

$x$	$y$
-10	22
-9	20
-8	18

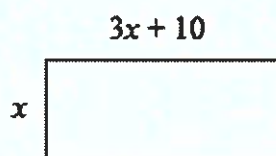
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## 2016 Mathematics Standards of Learning

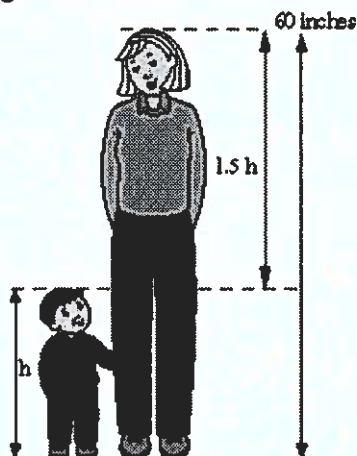
2016 Mathematics Standards of Learning

8.17

1. The perimeter of the fenced area shown is 260 meters. What is the measure of the side that is labeled  $x$  in the figure shown? Explain your reasoning.

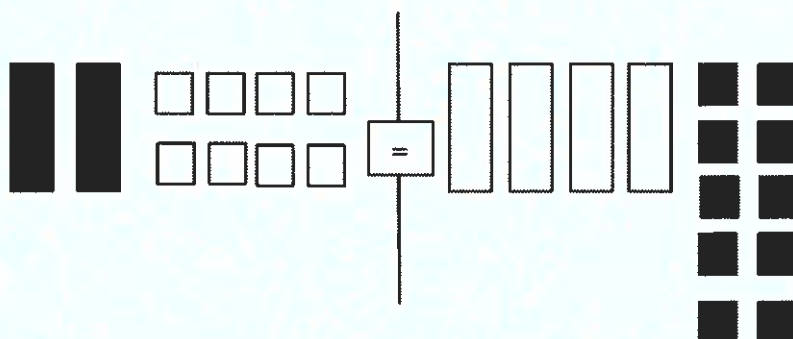
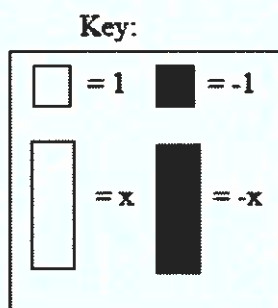


2. The figure below shows the heights of Rebecca and her brother Daniel.



What is Daniel's height ( $h$ )?

3. Using the given key, write a multistep linear equation to represent the model. Then solve and confirm your algebraic solution.



4. Mrs. Singh wrote this equation on the board.

$$\frac{1}{4}(2n - 28) = 10$$

What is the solution to the equation?

- A.  $n = 17$
  - B.  $n = 19$
  - C.  $n = 34$
  - D.  $n = 68$
5. Solve the equation below for  $p$ .

$$5p = 21 + 2p$$

- A. 3
  - B. 4
  - C. 7
  - D. 10
6. What value for  $x$  makes this equation true?

$$\frac{1}{2}(x - 9) = x - 23$$

- A. 16
  - B. 28
  - C. 37
  - D. 55
7. Provide the algebraic sentence that would represent the verbal sentence, “ten less than two-thirds of a number results in 15”.

Answer: \_\_\_\_\_

8. Provide the verbal expression that would represent the algebraic expression,  $2(x - 3) + 7$ .

Answer: \_\_\_\_\_



8.18

1. What is the solution to  $4(2 - x) \geq -(x - 5)$ ?

Last year the 8<sup>th</sup> grade students sold t-shirts during a fundraiser. Let  $t$  represent the number of t-shirts sold last year. This year's 8<sup>th</sup> grade students would like to sell 40 more than twice the number of t-shirts sold last year. This year's sales should not exceed 250 shirts. What solution set represents the possible number of t-shirts sold last year? Represent this situation using one inequality statement and determine the solution set.

a) Represent the inequality: \_\_\_\_\_

Solution Set: \_\_\_\_\_

2. Look at the number line below.

Which two inequalities could represent the solution set shown?



$$-4(x + 5) < -26 - x$$

$$13.5 < \frac{3}{4}x + 12$$

$$-\frac{1}{2}(x + 4) < -1$$

$$-10 < \frac{1}{4}x - 18$$

3. Identify all numerical values that are part of the solution set for the following inequality.

$$\frac{4x - 5}{8} \geq -10 + 3x$$

2016 Mathematics Standards of Learning

-4	5	3.75
4	-3.75	0

4. What value for  $x$  makes the following inequality true?  $-\frac{3}{8}x - 2 < -13 + 17$
- A. -15  
B. -16  
C. -17  
D. -18
5. The next step in solving the inequality  $-y < x + 2$  would be to divide both sides of the inequality by -1. Which of the following would then be true?
- A.  $x$  would remain positive.  
B. 2 would remain positive  
C. The inequality symbol would reverse direction  
D. The inequality symbol would remain the same
6. Select the statement that correctly represents the inequality below.
- Three times the quotient of a number and 2 increased by 5 is at most -12.
- A.  $3\left(\frac{n}{2}\right) + 5 \leq -12$   
B.  $\frac{3n}{2} + 5 \leq -12$   
C.  $3\left(\frac{n}{2}\right) + 5 \geq -12$   
D.  $\frac{3n}{2} + 5 \geq -12$

8.1

1. Harry ate  $\frac{1}{2}$  of a pie. Where would this amount be found on a number line representing the whole pie?

A between  $\frac{1}{4}$  and  $\frac{1}{16}$

B between  $\frac{1}{4}$  and  $\frac{5}{16}$

C between  $\frac{9}{16}$  and  $\frac{5}{8}$

D between  $\frac{7}{16}$  and  $\frac{5}{8}$

8.1

2. What fraction could you place in the blank to make a true statement?

$$0.15 < \underline{\hspace{1cm}} < 85\%$$

A  $\frac{5}{6}$

B  $\frac{6}{7}$

C  $\frac{7}{8}$

D  $\frac{9}{10}$

8.1

3. Arrange the following in order from least to greatest.

$$\frac{3}{10}, 72.5\%, 2^3, \frac{3}{2}, \sqrt{4}$$

A  $2^3, \frac{3}{2}, \frac{3}{10}, \sqrt{4}, 72.5\%$

B  $\frac{3}{10}, 72.5\%, \sqrt{4}, \frac{3}{2}, 2^3$

C  $\frac{3}{10}, 72.5\%, \frac{3}{2}, \sqrt{4}, 2^3$

D  $\sqrt{4}, 2^3, \frac{3}{10}, 72.5\%, \frac{3}{2}$

8.2

4. Which lists all of the sets of the real number system to which the number 424 would belong?

A real, rational, integers

B integer, whole numbers, natural numbers

C real, rational, integers, natural numbers

D real, rational, integers, whole numbers, and natural numbers

8.2

5. Which set contains one irrational number?

A  $\{-4, 0, \sqrt{17}\}$

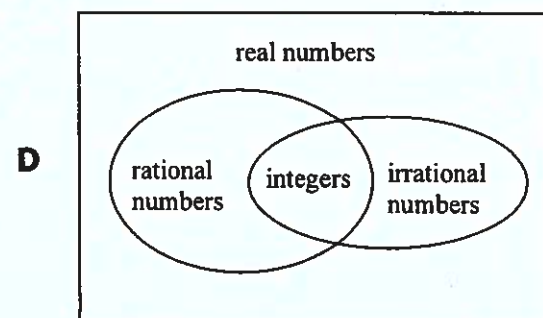
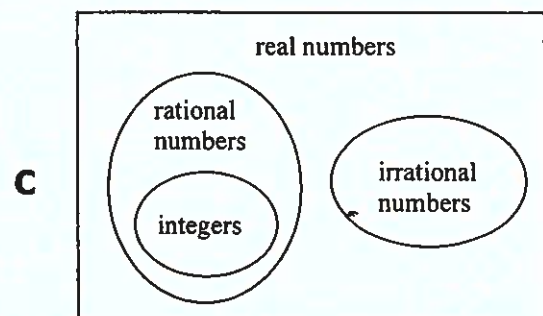
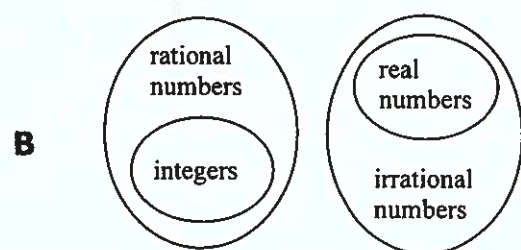
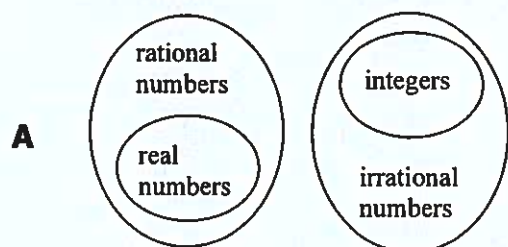
B  $\{-2, 1, \frac{1}{4}\}$

C  $\{-3, \sqrt{16}, 5\}$

D  $\{0, 3, 1\}$

8.2

6. Which is a Venn diagram that shows the relationship between the sets of integers, rational numbers, real numbers, and irrational numbers?





8.3a

**7. Which of the following best represents  $\sqrt{24}$  ?**

**A number between-**

- A** 3 and 4.
- B** 4 and 5.
- C** 5 and 6.
- D** 6 and 7.

8.3a

**8. The square root of 95 is between which two consecutive whole numbers?**

- A** 6 and 7
- B** 7 and 8
- C** 8 and 9
- D** 9 and 10

8.3b

**9. What are the square roots of  $\sqrt{289}$  ?**

- A** 16 and -18
- B** 17 and -17
- C** -18 and 18
- D** 19 and -19

8.4

**10. At a pizza restaurant, you order a large pizza for \$12.95 and a soda for \$1.25. Sales tax is 4  $\frac{1}{2}$ %. What is the total of your bill including sales tax?**

- A** \$14.25
- B** \$14.65
- C** \$14.84
- D** \$18.70

8.4

11. If the regular price is \$85.00 and the discount rate is 10%, what is the sale price?

- A \$68.00
- B \$75.00
- C \$76.50
- D \$84.15

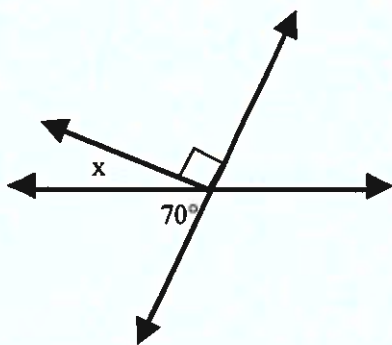
8.4

12. Jason's checkbook had a balance of \$525.02 on May 5. On May 6, he wrote a check for \$107.65 at the grocery store. On May 8, he wrote a check for \$228.00 for his car payment. On May 9, his grandmother sent him \$55.00 and he deposited this in his account. What is the balance of Jason's account after this deposit?

- A \$244.37
- B \$334.37
- C \$700.37
- D \$915.67

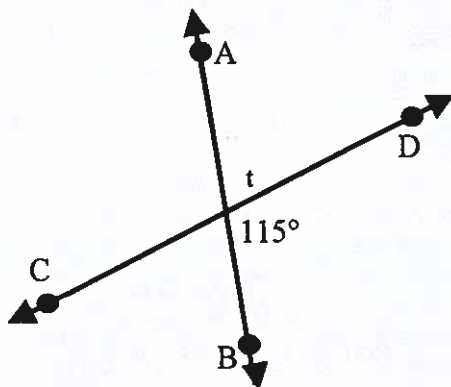
8.5

13. What is the measure of  $\angle x$ ?



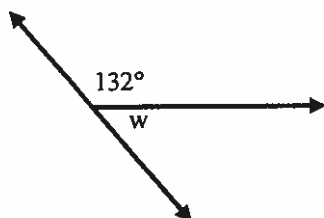
- A  $10^\circ$
- B  $20^\circ$
- C  $65^\circ$
- D  $110^\circ$

8.5

**14. What is the measure of  $\angle t$ ?**

- A**  $35^\circ$
- B**  $65^\circ$
- C**  $85^\circ$
- D**  $115^\circ$

8.5

**15. What is the measure of  $\angle w$ ?**

- A**  $32^\circ$
- B**  $48^\circ$
- C**  $52^\circ$
- D**  $180^\circ$

8.6a

**16. What is the volume of the figure below?****Cone**

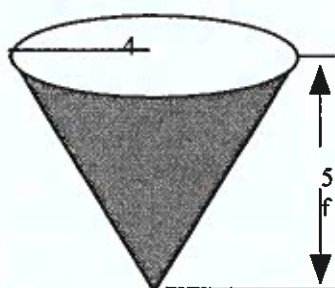
$$SA = \pi l + \pi r^2$$

$$V = \frac{1}{3} \pi r^2 h$$

**Pyramid**

$$SA = \frac{1}{2} lp + B$$

$$V = \frac{1}{3} Bh$$



- A** 16.75 cu. ft.
- B** 20.93 cu. ft.
- C** 83.73 cu. ft.
- D** 96.75 cu. ft.

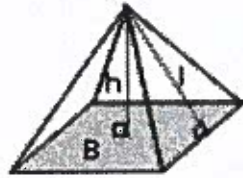
8.6a

17. What is the total surface area of a pyramid with a square base with sides of 25 cm, where the faces have a height of 20 cm?

**Cone**

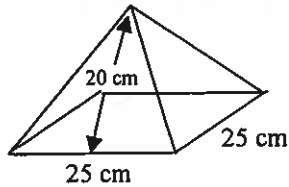
$$SA = \pi r l + \pi r^2$$

$$V = \frac{1}{3} \pi r^2 h$$

**Pyramid**

$$SA = \frac{1}{2} l p + B$$

$$V = \frac{1}{3} B h$$

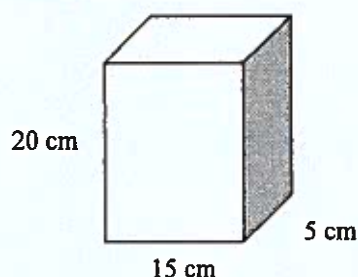


- A 250 cm<sup>2</sup>
- B 625 cm<sup>2</sup>
- C 1,000 cm<sup>2</sup>
- D 1,625 cm<sup>2</sup>



8.6b

- 18. A prism has a length of 15 cm, a width of 5 cm and a height of 20 centimeters.**

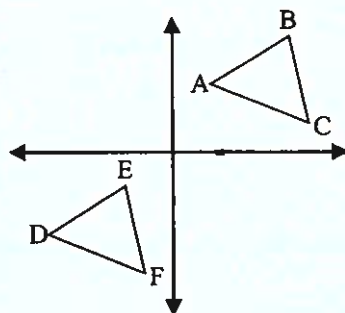


**If the width of the prism is increased by a scale factor of 5, what will be the change in volume?**

- A** increased by 3,000  $\text{cm}^3$
- B** increased by 4,000  $\text{cm}^3$
- C** increased by 5,000  $\text{cm}^3$
- D** increased by 6,000  $\text{cm}^3$

8.7a

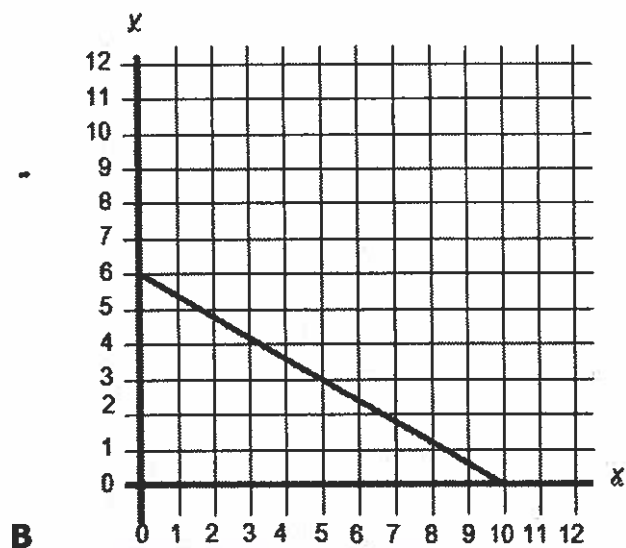
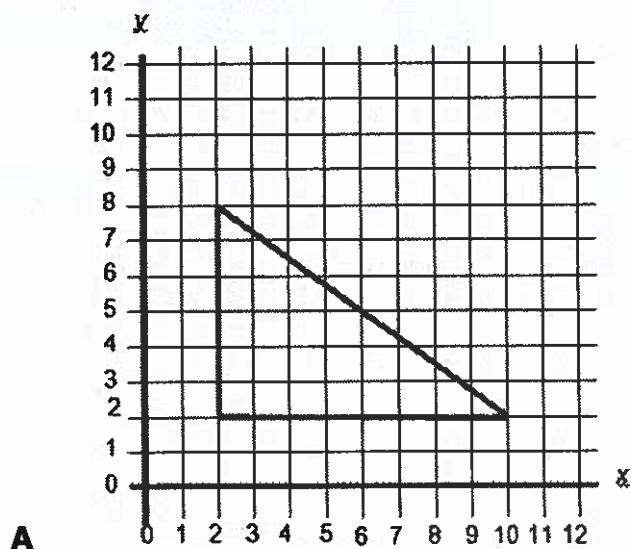
- 19. What was done to  $\triangle ABC$  to produce  $\triangle DEF$  ?**

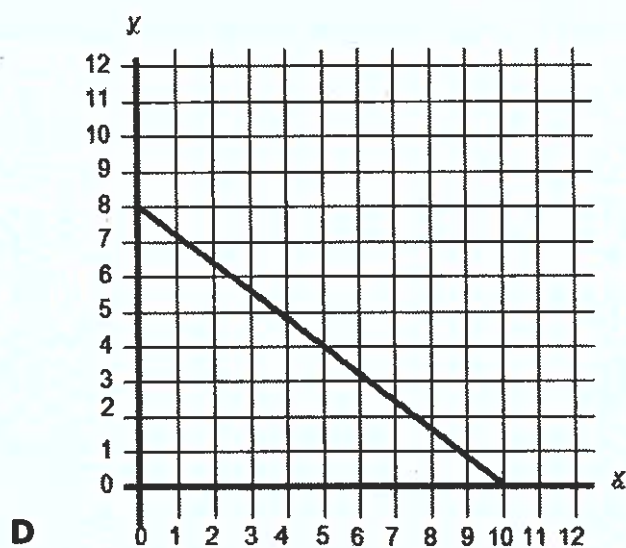
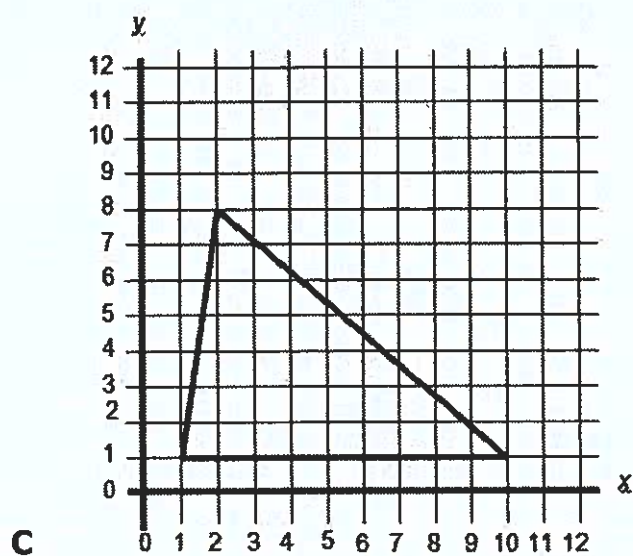


- A** translation
- B** rotation
- C** dilation
- D** reflection

8.7a

20. A right triangle is plotted  $(0, 0)$ ,  $(0, 4)$ , and  $(5, 0)$  and then a scale factor of 2 is applied to these coordinates. Which choice represents this dilation?





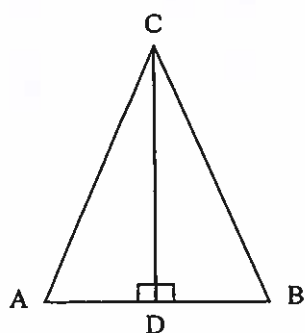
8.9a

21. The lengths of the sides of four triangles are given below. Using the Pythagorean Theorem, which set of lengths forms a right triangle?

- A 9, 12, 15
- B 5, 12, 14
- C 16, 30, 35
- D 18, 36, 54

8.9a

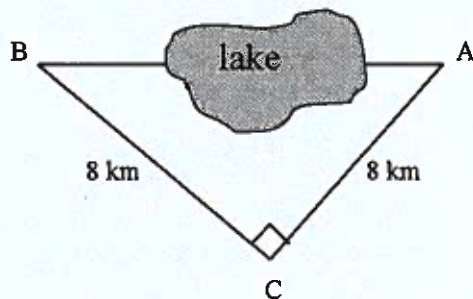
22. Which segment is a hypotenuse?



- A  $\overline{AB}$
- B  $\overline{CD}$
- C  $\overline{DB}$  and  $\overline{AD}$
- D  $\overline{AC}$  and  $\overline{BC}$

8.9b

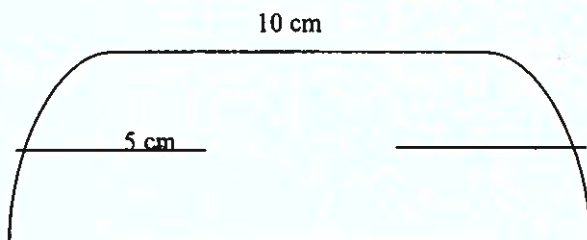
23. We want to find the distance from point A to point B. However, there is a lake between the points. So, we measure the distance from point A to point C and from point C to point B, as shown below. How far is it from point A to point B?



- A about 8.5 km
- B about 11.3 km
- C about 13.2 km
- D about 16 km

8.10

24. What is the distance around the outside of this figure?

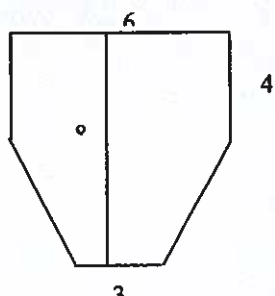


- A 30.7 cm
- B 35.7 cm
- C 40.7 cm
- D 45.7 cm



8.10

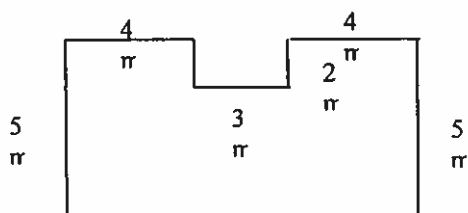
25. What is the area of the figure below?



- A  $36 \text{ m}^2$
- B  $42 \text{ m}^2$
- C  $48 \text{ m}^2$
- D  $54 \text{ m}^2$

8.10

26. What is the area of the figure below?



- A  $32 \text{ m}^2$
- B  $49 \text{ m}^2$
- C  $52 \text{ m}^2$
- D  $55 \text{ m}^2$

8.14a

27. Evaluate  $2x^2 + y(x + 1)$ , given  $x = 5$  and  $y = 6$ .

- A 56
- B 62
- C 86
- D 136

8.14a

28. Evaluate  $a - 2(b + 2)$ , if  $a = 20$  and  $b = 8$ .

- A 0
- B 10
- C 18
- D 180

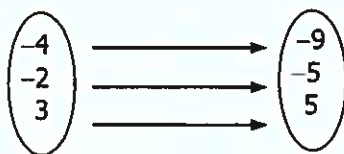
8.14b

29. Which expression is the same as  $8y + 20$ ?

- A  $8 + 20 + y$
- B  $2y + 20 + 6y$
- C  $8(y + 20)$
- D  $4(2y + 20)$

8.15a

30. Which could represent the following mapping algebraically?



- A  $y = -(x + 13)$
- B  $y = 3(x + 1)$
- C  $y = 2x - 1$
- D  $y = |x - 5|$

Use the relation below to answer the next two questions.

$(5, 6), (4, 3), (1, 5), (3, 0)$

8.15b

31. What is the domain of the relation?

- A  $\{6, 3, 5, 0\}$
- B  $\{5, 4, 1, 3\}$
- C  $\{3, 3, 5, 5\}$
- D  $\{5, 6, 3, 0\}$

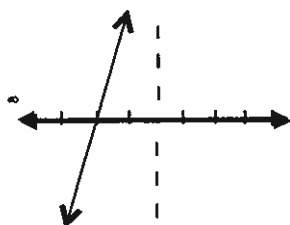
8.15b

32. What is the range of the relation?

- A  $\{2, 1, -4, 3\}$
- B  $\{5, 4, 1, 3\}$
- C  $\{6, 3, 5, 0\}$
- D  $\{11, 7, 6, 3\}$

8.16a

33. What term describes the slope of this graph?



- A positive
- B negative
- C zero
- D undefined

8.16b

34. What is the slope of the line defined by the equation  $y = -\frac{2}{3}x + \frac{5}{3}$ ?

A  $\frac{2}{3}$

B  $\frac{3}{5}$

C  $-\frac{3}{5}$

D  $-\frac{2}{3}$

8.16c

35. Sarah made a table comparing the diameter to the radius of four circles.

Diameter	1.2	2.5	3.8	4.1
Radius	0.6	1.25	1.9	2.05

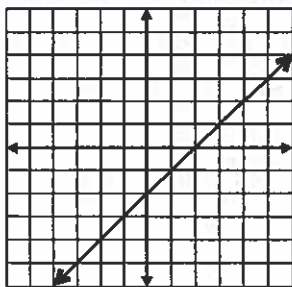
The equation that represents this information is  $D = 2r$ .

What statement is true about the variables  $D$  and  $r$ ?

- A  $r$  is the independent variable and  $D$  is the dependent variable
- B  $D$  is the independent variable and  $r$  is the dependent variable
- C  $r$  is a function and  $D$  is not a function
- D  $D$  is a coefficient and  $r$  is an equation

8.16e

36. Which of the following tables corresponds to this graph?

**A**

$x$	$y$
-2	4
-1	2
0	0
1	-2
2	-4

**B**

$x$	$y$
0	0
1	-1
2	-2
3	-3
4	-4

**C**

$x$	$y$
2	0
1	-1
0	-2
-1	-3
-2	-4

**D**

$x$	$y$
-2	-2
-1	-1
0	0
1	1
2	2



8.17

**37. What is the solution for  $4(x + 1) = 8$  ?**

**A**  $x = 1$

**B**  $x = \frac{4}{3}$

**C**  $x = \frac{3}{2}$

**D**  $x = 2$

8.17

**38. Solve the equation:  $13 - 2x = -7$** 

**A**  $x = 3$

**B**  $x = -3$

**C**  $x = -10$

**D**  $x = 10$

8.17

**39. Kate called her grandfather long- distance on Tuesday. The first 3 minutes cost \$2, and each minute after that cost \$0.50. How much did it cost if they talked for 15 minutes?**

**A** \$7.50

**B** \$8.00

**C** \$12.00

**D** \$15.50

8.18

40. Solve:

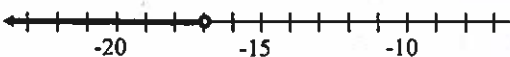
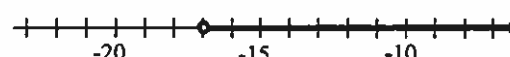
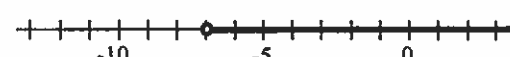
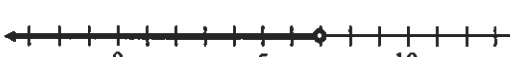
$$\frac{4y}{3} < 8$$

- A  $y < 6$
- B  $y > 6$
- C  $y < 8$
- D  $y > 8$

8.18

41. Solve the inequality:  $5(1 - x) < 4(3 - x)$ 

Which graph represents this inequality?

- A 
- B 
- C 
- D 

8.18

42. Mrs. Corbett rented a truck to move some furniture. The rental charge is \$60 plus \$0.25 per mile. She wants to spend no more than \$180, not including tax. What is the maximum number of miles that she can drive the truck?

- A 85 miles
- B 360 miles
- C 480 miles
- D 720 miles