PRACTICE TEST -
This is the released questions from the
2014 Grade 8 Math MCAS

1 What is the value of the expression below?

$$\frac{2^6}{2^2}$$

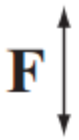
A. 8

B. 16

C. 256

D. 4096

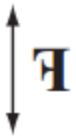
2 Frank wrote his initial to the left of a line, as shown below.

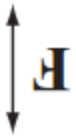


Then he reflected his initial over the line. Which of the following shows Frank's initial after the reflection?

A. 

B. 

C. 

D. 

3 The volume of a cube is 64 cubic inches. What is the length of one edge of the cube?

A. 4 inches

B. 8 inches

C. 21 inches

D. 32 inches

4 Which ordered pair is the solution of the system of equations below?

$$x + 2y = 6$$
$$3x + 8y = 4$$

A. (2, 2)

B. (4, 10)

C. (10, –2)

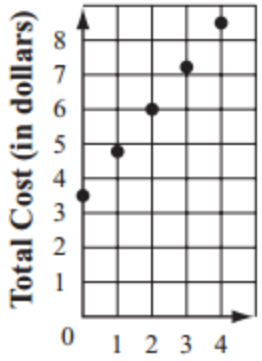
D. (20, –7)

5 Juan purchased one binder for \$3.50 and f folders for \$1.25 each. The total cost, C, in dollars, of Juan's purchase is represented by the equation below.

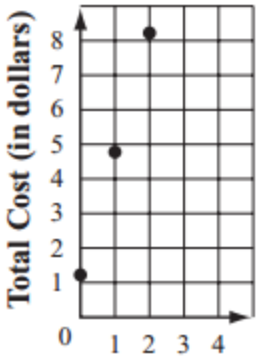
$$C = 3.50 + 1.25f$$

Which of the following graphs represents C, the total cost of Juan's purchase if he buys different numbers of folders?

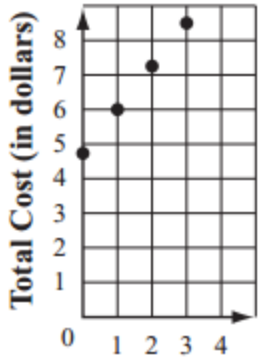
A. **Juan's Purchase**



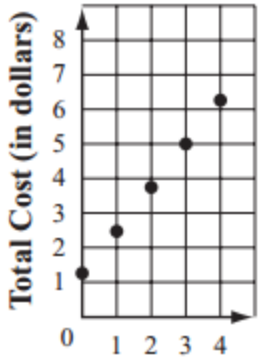
C. **Juan's Purchase**



B. **Juan's Purchase**



D. **Juan's Purchase**



6 List the following expressions in order from least to greatest value.

$$\sqrt{5},\ \pi,\ \sqrt{3}$$

7 The average distance between planet Neptune and the Sun is about 4×10^9 kilometers.

What is 4×10^9 written in standard notation?

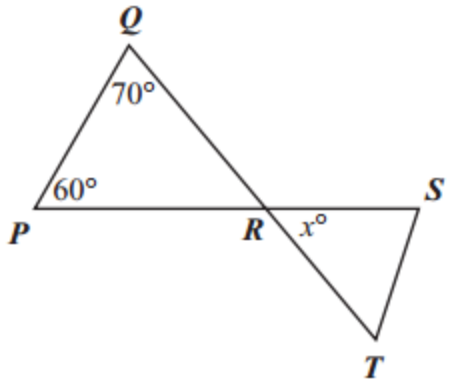
A. 0.0000000004

B. 0.000000004

C. 400,000,000

D. 4,000,000,000

8 Triangle *PQR*, triangle *RST*, and two angle measures are shown below.



Line segment *QT* intersects line segment *PS* at point *R*.

What is the value of x?

9 Which of the following equations represents a linear function?

A. $y = 3x^2$

B. $y = 2 - \frac{6}{x}$

C. $y = \sqrt{x} + 6$

D. $y = \frac{1}{2}x + 3$

10 What is the value of the expression below?

$$\sqrt{25} - 9 \cdot 2^3$$

A. -67

B. -48

C. 24

D. 32

11 A principal surveyed 75 seventh-grade and eighth-grade students. She asked them if they prefer to obtain the news from the Internet or to obtain the news from television. She created a table to display the data, as shown below.

		News Preference	
		Internet	**Television**
Students	**Seventh Grade**	16	34
	Eighth Grade	10	15

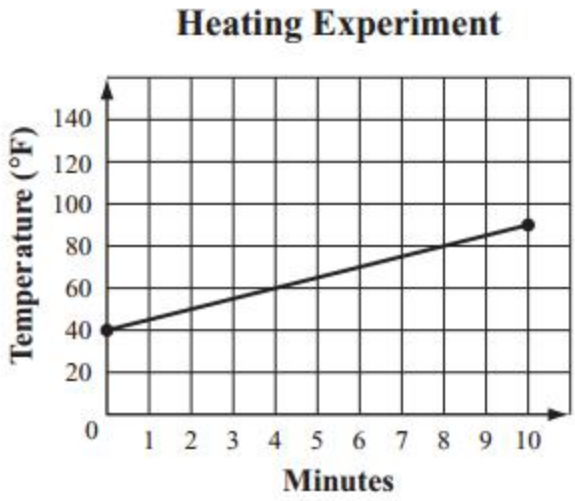
a. How many seventh-grade students responded to the survey? Show or explain how you got your answer.

b. What is the relative frequency of seventh-grade students who prefer to obtain the news from the Internet to all the seventh-grade students surveyed? Show or explain how you got your answer.

c. What is the relative frequency of eighth-grade students who prefer to obtain the news from the Internet to all the eighth-grade students surveyed? Show or explain how you got your answer.

d. Is there evidence in the principal's survey that eighth-grade students prefer to obtain the news from the Internet more than seventh-grade students do? Explain your reasoning.

12 The graph below shows the temperature, in degrees Fahrenheit, of a liquid for the first ten minutes of a heating experiment.



Based on the graph, which expression could be used to calculate the temperature of the liquid after m minutes?

A. $5m + 40$

B. $-5m - 40$

C. $10m + 40$

D. $-10m - 40$

13 Ted has some red blocks and some green blocks.

- Each red block weighs the same number of ounces.
- Each green block weighs the same number of ounces.
- The total weight of 2 red blocks and 6 green blocks is 23 ounces.
- The total weight of 3 red blocks and 4 green blocks is 22 ounces.

What is the total weight of 1 red block **and** 1 green block?

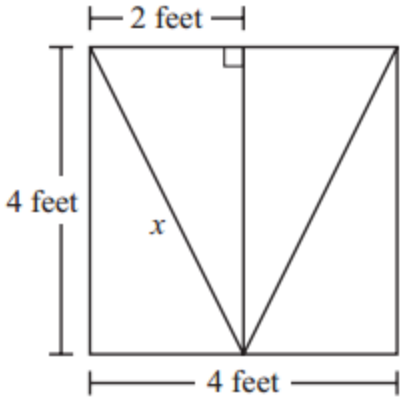
A. 3 ounces

B. 6 ounces

C. 6.5 ounces

D. 13.5 ounces

14 A stained glass window is in the shape of a square. A sketch of the window, with some of its dimensions, is shown below.



What is the length, to the nearest tenth of a foot, of the line segment labeled x?

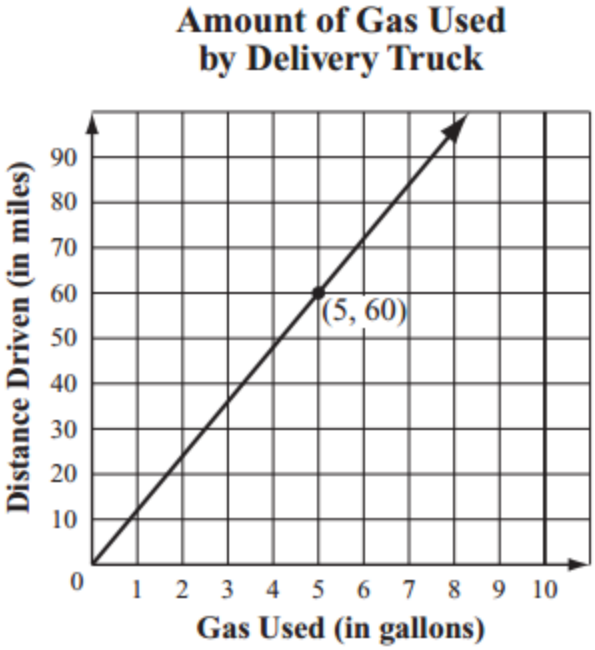
A. 5.7 feet

B. 4.5 feet

C. 3.5 feet

D. 2.4 feet

15 The graph below shows the relationship between the distance a delivery truck is driven and the amount of gas the truck uses.



Based on the graph, what is the average distance, in miles, the truck can be driven using 1 gallon of gas?

A. 10

B. 12

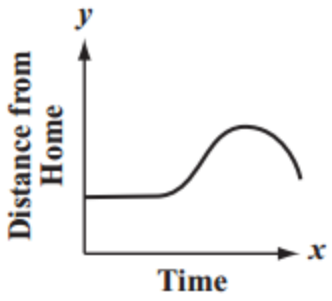
C. 14

D. 16

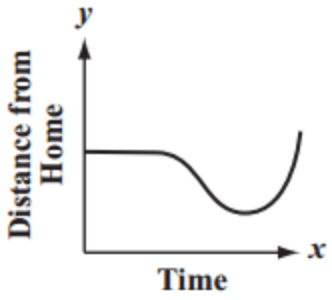
16 Kiki is taking a bicycle ride. During the ride, Kiki is always traveling **away** from the starting point.

Which of the following graphs of distance and time could model Kiki's ride?

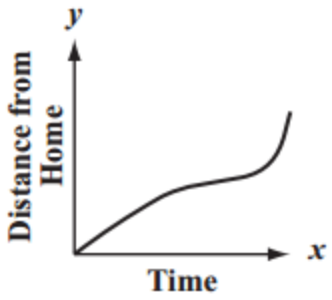
A.



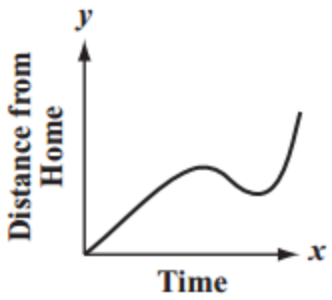
B.



C.



D.



17 Which statement is true about the equation below?

$$3(2 - k) = -3k + 2$$

A. The equation has no solution.

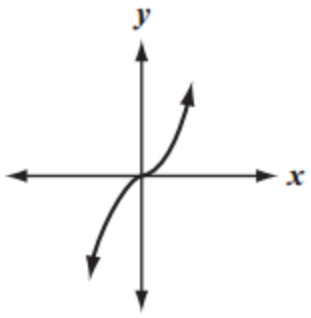
B. The equation has one solution.

C. The equation has two solutions.

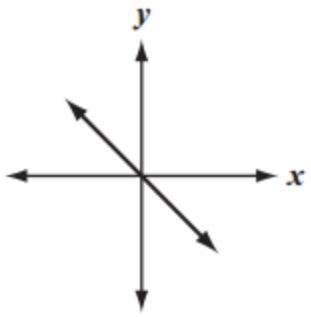
D. The equation has infinitely many solutions.

18 Which of the following graphs shows a linear function?

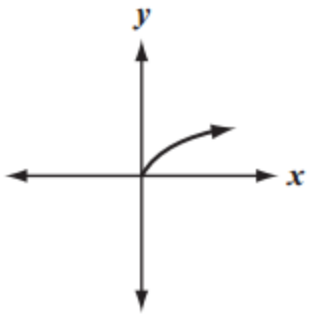
A.



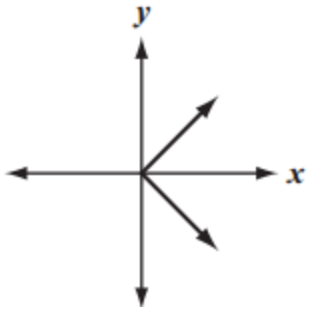
B.



C.



D.

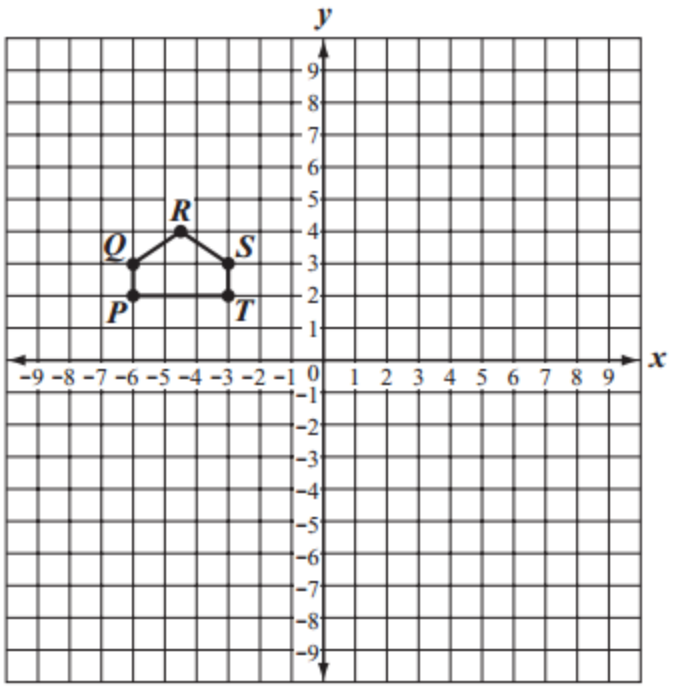


19 The table below shows a relationship between x and y that is **not** a function.

x	y
3	6
4	6
5	7
5	8
6	10
10	9
11	11

Write one ordered pair that can be removed from the table to make the relationship between x and y a function.

20 Pentagon $PQRST$ is shown on the coordinate grid below.



On the grid in your Student Answer Booklet, copy the x-axis, the y-axis, and pentagon $PQRST$ exactly as shown.

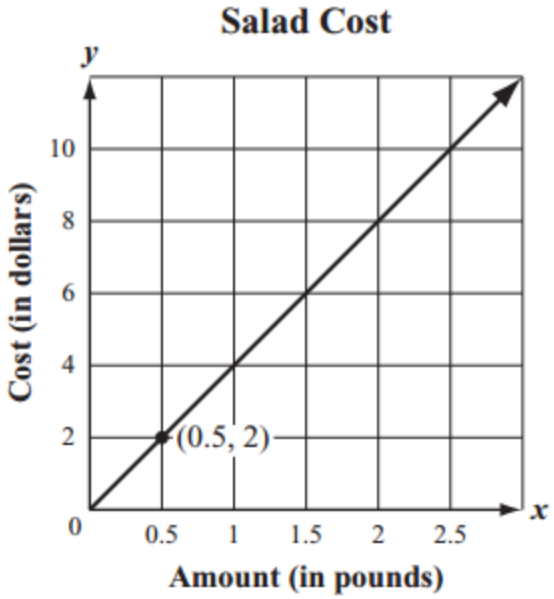
a. What are the coordinates of vertex T?

b. On the grid in your Student Answer Booklet, draw the image of pentagon $PQRST$ after it has been translated 6 units to the right. Label the image $P'Q'R'S'T'$.

c. What are the coordinates of vertex T'?

d. On the grid in your Student Answer Booklet, draw the image of pentagon $P'Q'R'S'T'$ after it has been rotated 180° clockwise about vertex T'.

21 The graph below represents y, the cost in dollars of x pounds of salad at a salad bar.



What is the unit rate for the cost of a salad at the salad bar?

A. \$0.50 per pound

B. \$1.00 per pound

C. \$2.00 per pound

D. \$4.00 per pound

MASSACHUSETTS DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION

Massachusetts Comprehensive Assessment System
Grade 8 Mathematics Reference Sheet

PERIMETER FORMULAS

square . . . . . $P = 4s$

rectangle . . . . . $P = 2b + 2h$

OR

$P = 2l + 2w$

triangle . . . . . $P = a + b + c$

AREA FORMULAS

square . . . . . $A = s^2$

rectangle . . . . . $A = bh$

OR

$A = lw$

parallelogram . . . . . $A = bh$

triangle . . . . . $A = \frac{1}{2}bh$

trapezoid . . . . . $A = \frac{1}{2}h(b_1 + b_2)$

circle . . . . . $A = \pi r^2$

TOTAL SURFACE AREA FORMULAS

rectangular prism . . $SA = 2(lw) + 2(hw) + 2(lh)$

cylinder . . . . . $SA = 2\pi r^2 + 2\pi rh$

sphere . . . . . $SA = 4\pi r^2$

VOLUME FORMULAS

rectangular prism . . . . . $V = lwh$

OR

$V = Bh$

(B = area of a base)

cube . . . . . $V = s^3$

(s = length of an edge)

cylinder . . . . . $V = \pi r^2 h$

sphere . . . . . $V = \frac{4}{3}\pi r^3$

CIRCLE FORMULAS

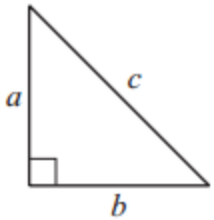
$C = 2\pi r$

OR

$C = \pi d$

$A = \pi r^2$

PYTHAGOREAN THEOREM



$a^2 + b^2 = c^2$