

Math  
Spring 2021  
Grade 8  
Released Items

**M800227**

**1.**

Which decimal is equivalent to  $1\frac{5}{9}$ ?

- A.  $1.\bar{5}$
- B.  $1.\overline{59}$
- C.  $1.\bar{6}$
- D.  $1.\overline{95}$

**M800399**

**2.**

Which value is closest to  $\sqrt{51}$ ?

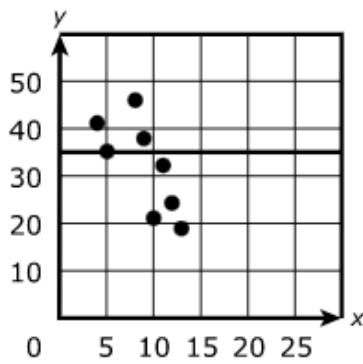
- A. 6.5
- B. 7
- C. 7.5
- D. 8

3.

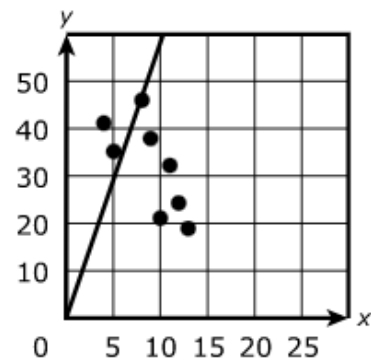
M800267

A student used a line of best fit to represent the data in a scatter plot. Which graph represents a line of best fit for the data?

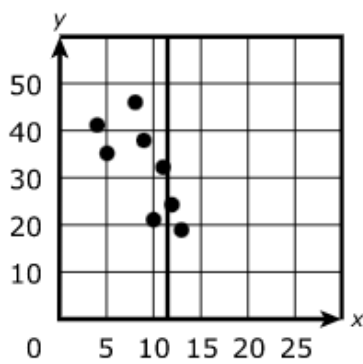
A.



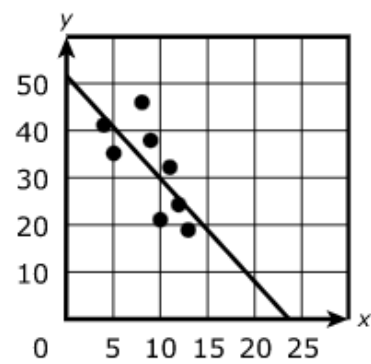
B.



C.



D.



4.

Solve the equation.

$$-3(3 - 4x) = 5(x - 1) + 7(x + 2)$$

Show each step you used to solve the equation. Determine whether the equation has one solution, no solution, or infinitely many solutions. Explain your reasoning.

Enter your answer, your work, and your explanation in the space provided.



▼ Math symbols

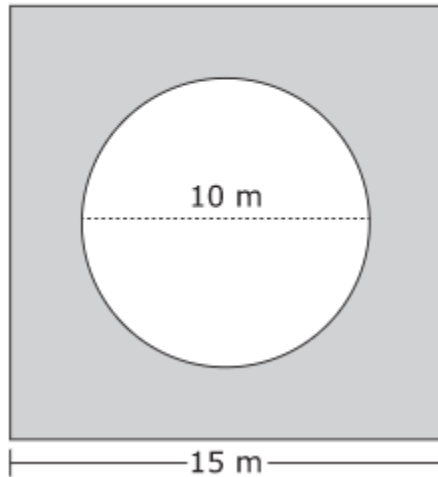
+	-	×	÷
±	-	·	/
=	≠	≡	≡
$y^x$	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	$x_i$
$\pi$	(	)	°
·			

► Relations

5.

VH239108

The shaded part of the diagram represents a concrete patio in the shape of a square that completely surrounds a circular swimming pool.



**Part A**

What is the area, in square meters, of the patio? Round your answer to the nearest hundredth. Show or explain the steps you used to find the answer.

Enter your answer and your work or explanation in the space provided.



▼ Math symbols

+	-	×	÷
±	-	·	/
=	≠	$\frac{\square}{\square}$	$\frac{\square}{\square}$
$y^x$	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	$x_i$
$\pi$	(	)	°
x			

► Relations

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5. (Continued from previous page)

VH239108

**Part B**

The patio will be completely covered with paint. Each gallon of paint will cover an area of 32.5 square meters.

What is the minimum number of gallons of paint that will need to be purchased to cover the patio with paint? Show or explain the steps you used to find the answer.

Enter your answer and your work or explanation in the space provided.



▼ Math symbols

+	-	×	÷
±	-	·	/
=	≠	≡	≡
$x^y$	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	$x_i$
$\pi$	(	)	°
x			

► Relations

**(Continues on next page)**

## 5. (Continued from previous page)

VH239108

### Part C

The cost for each gallon of paint is \$27.98, not including tax. What will be the total cost in dollars, not including tax, to cover the patio with paint? Show or explain your answer.

Enter your answer and your work or explanation in the space provided.



▼ Math symbols

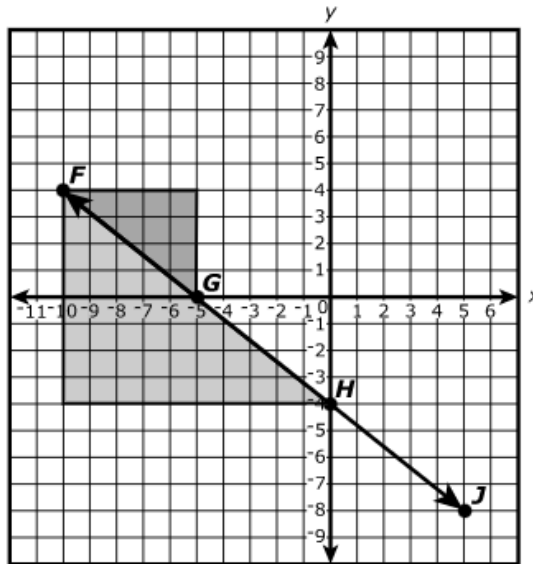
+	-	×	÷
±	-	·	/
=	≠	≡	≡
$y^x$	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	$x_i$
$\pi$	(	)	°
x			

► Relations

6.

M800273

The coordinate plane shows  $\overline{FJ}$ , points  $G$  and  $H$  on  $\overline{FJ}$ , and two right triangles. One triangle has  $\overline{FG}$  as its hypotenuse, and the other triangle has  $\overline{FH}$  as its hypotenuse, as shown.



Which set of statements correctly compares the slope of  $\overline{FG}$  with the slope of  $\overline{FH}$ ?

- A.  $\overline{FG}$  has a slope of  $\frac{-5}{4}$ .  $\overline{FH}$  has a slope of  $\frac{-10}{8}$ . The slope of  $\overline{FG}$  is equivalent to the slope of  $\overline{FH}$ .
- B.  $\overline{FG}$  has a slope of  $\frac{-5}{4}$ .  $\overline{FH}$  has a slope of  $\frac{10}{8}$ . The slope of  $\overline{FG}$  is not equivalent to the slope of  $\overline{FH}$ .
- C.  $\overline{FG}$  has a slope of  $\frac{-4}{5}$ .  $\overline{FH}$  has a slope of  $\frac{-8}{10}$ . The slope of  $\overline{FG}$  is equivalent to the slope of  $\overline{FH}$ .
- D.  $\overline{FG}$  has a slope of  $\frac{-4}{5}$ .  $\overline{FH}$  has a slope of  $\frac{8}{10}$ . The slope of  $\overline{FG}$  is not equivalent to the slope of  $\overline{FH}$ .



## 7.

An office manager is deciding between two meal-delivery services.

**Part A**

The first service charges \$81.50 for the first month. This charge includes the expenses listed:

- the cost of 3 meals per week for 4 weeks
- a shipping fee of \$1.75 per meal
- a coupon for \$17.50 off the first month

Which equation can be used to determine  $x$ , the original cost, in dollars, of each meal during the first month of this service?

- A.  $12(x + 1.75) - 17.50 = 81.50$
- B.  $12(x - 1.75) - 17.50 = 81.50$
- C.  $12(x + 1.75) + 17.50 = 81.50$
- D.  $12(x - 1.75) + 17.50 = 81.50$

**Part B**

The second service charges \$125 for the first month. This charge includes the expenses listed:

- the cost of 5 meals per week for 4 weeks
- a discount of \$1.50 off the first 5 meals
- a one-time shipping fee of \$12.50

What is the original cost, in dollars, of each meal during the first month of this service?

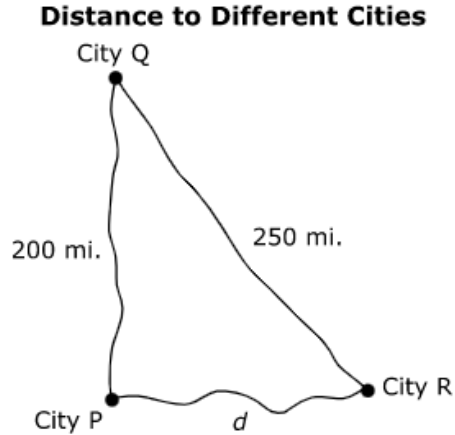
Enter your answer in the box.

8.

M800330

A truck driver travels to different cities. The driver's typical route starts at City P and goes through cities Q, R, and back to City P.

- The distances, in miles (mi.), from City P to City Q and from City Q to City R are shown.
- The unknown distance,  $d$ , from City R back to City P is labeled.



The angle formed at the vertex of City P is approximately 90 degrees.

- Determine the approximate total distance, in miles, the truck driver travels after going from City P through cities Q and R, and back to City P. Show your work or explain how you determined your answer.
- The driver's normal speed from City R to City P is 66 miles per hour. Today, the driver completes the drive from City R to City P in  $2\frac{1}{2}$  hours. Is today's speed greater than the speed normally traveled? Show your work or explain how you determined your answer.

Enter your answers and your work or explanations in the space provided.



▼ Math symbols

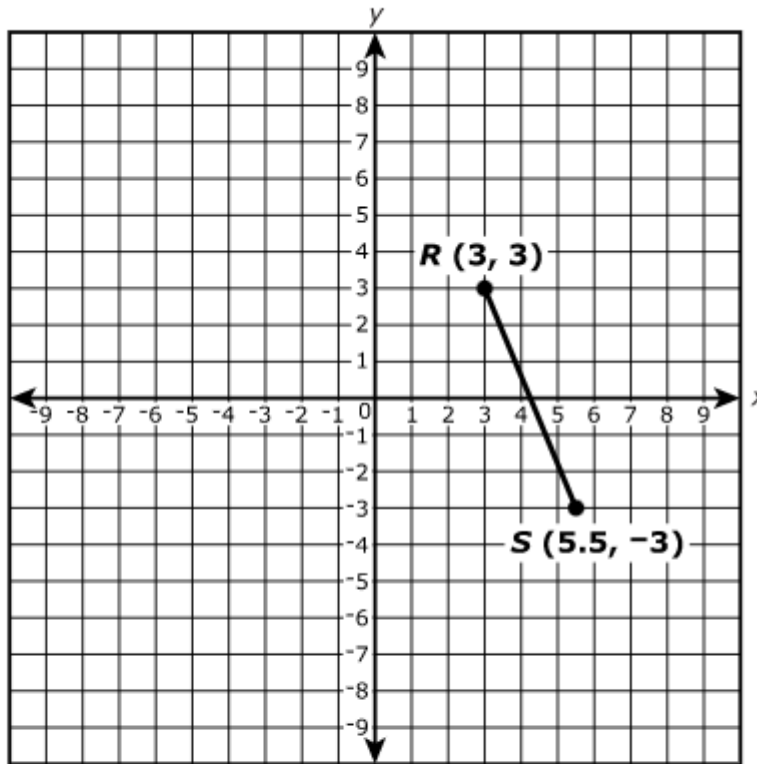
+	-	×	÷
±	-	·	/
=	≠	≡	≡
$x^y$	$\sqrt{\quad}$	$\sqrt[3]{\quad}$	$x_i$
$\pi$	(	)	°
$  \quad  $			

► Relations

9.

M800103

The coordinate plane shows  $\overline{RS}$ .



What is the length, in units, of  $\overline{RS}$ ?

Enter your answer in the box.

**10.**

**M800389**

**Part A**

A right circular cone has a height of 11 centimeters and a diameter of 7 centimeters. What is the approximate volume, in cubic centimeters, of the cone?

- A.  $44.9\pi$
- B.  $70.6\pi$
- C.  $179.7\pi$
- D.  $282.3\pi$

**Part B**

A right cylinder has a volume of  $1,296\pi$  cubic meters and a height of 9 meters. What is the diameter, in meters, of the cylinder?

Enter your answer in the box.

**Part C**

A sphere has a radius of 4 millimeters. What is the volume, in cubic millimeters, of the sphere?

Enter your answer in the box.

**Part D**

Information about the radius and the height of a right cylinder and a right circular cone are given.

- The radius of the cylinder is 6 times the radius, in centimeters, of the cone.
- The cylinder and the cone have the same height.

How many times greater is the volume of the cylinder than the volume of the cone?

- A. 6
- B. 18
- C. 36
- D. 108