Student Name _____

P

MCAP Maryland Comprehensive Assessment Program

Grade 8 Mathematics Test Book

Practice Test

TEST BOOKLET SECURITY BARCODE

Section 1
(Non-Calculator)

Directions:

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Directions for Completing the Answer Grids

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EXAMPLES

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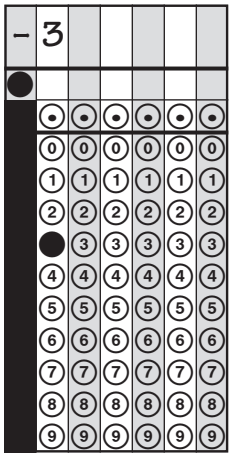

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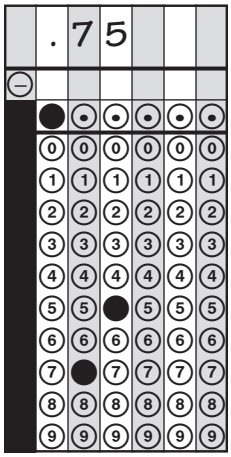
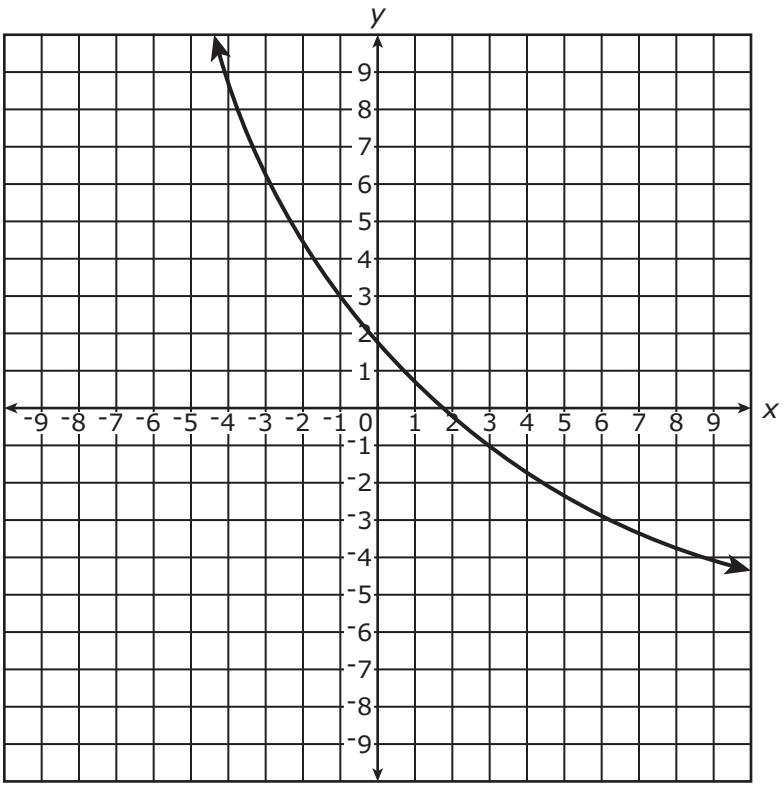


1 The graph of a function is shown.



Which statement is true about the graph of the function?

A The graph is always decreasing and nonlinear.

B The graph is always increasing and nonlinear.

C The graph is always decreasing and linear.

D The graph is always increasing and linear.

2 Which fraction is equivalent to $\sqrt{\frac{16}{36}}$?

A $\frac{4}{18}$

B $\frac{8}{18}$

C $\frac{4}{6}$

D $\frac{8}{6}$

3 Line segment *PQ* is the result of reflecting line segment *AB* across the *x*-axis. The coordinates of point *P* are (2, −2) and the coordinates of point *Q* are (8, −2).

What is the length of line segment *AB*?

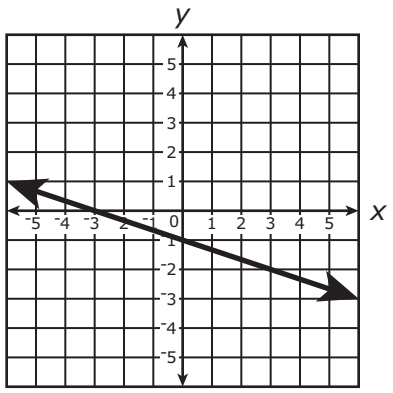
A 4

B 6

C 8

D 10

4 The graph shown on the coordinate plane represents a linear function.



Which function is represented by the graph?

A $3x + y = -6$

B $3x + y = -3$

C $x + 3y = -3$

D $x + 3y = -6$

5 Which decimal is equivalent to $\frac{5}{6}$?

A 0.83

B $0.8\overline{3}$

C 1.2

D $1.\overline{2}$

6 Which equation has infinitely many solutions?

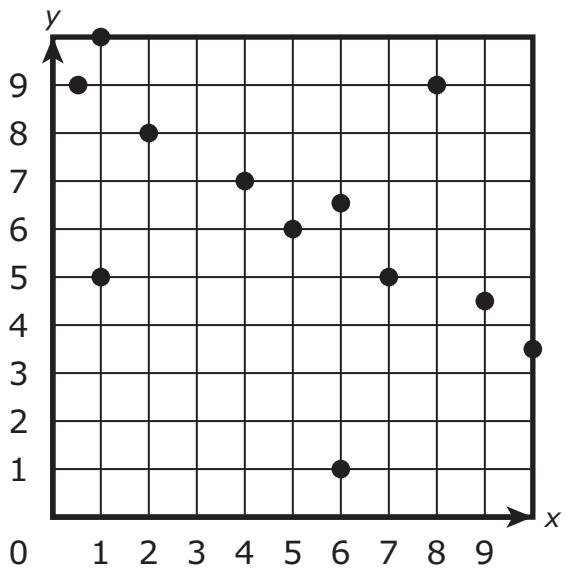
A $5(x + 1) = x + 1$

B $5(x + 1) = x + 5$

C $5(x + 1) = 5x + 1$

D $5(x + 1) = 5x + 5$

7 The scatter plot on the coordinate plane shows points that represent a relationship between x and y.



Which phrase **best** describes the relationship between x and y as shown in the scatter plot?

A positive and linear

B negative and linear

C positive but not linear

D negative but not linear

8 The population of the world is estimated to be 8×10^9. The population of a country is estimated to be 2×10^8.

The world population is about how many times as large as the population of the country?

Enter your answer in the space provided.

9 An expression is shown.

$$\frac{(2^6)^3 \times 2^6}{2^3}$$

Which expression is equivalent to the given expression?

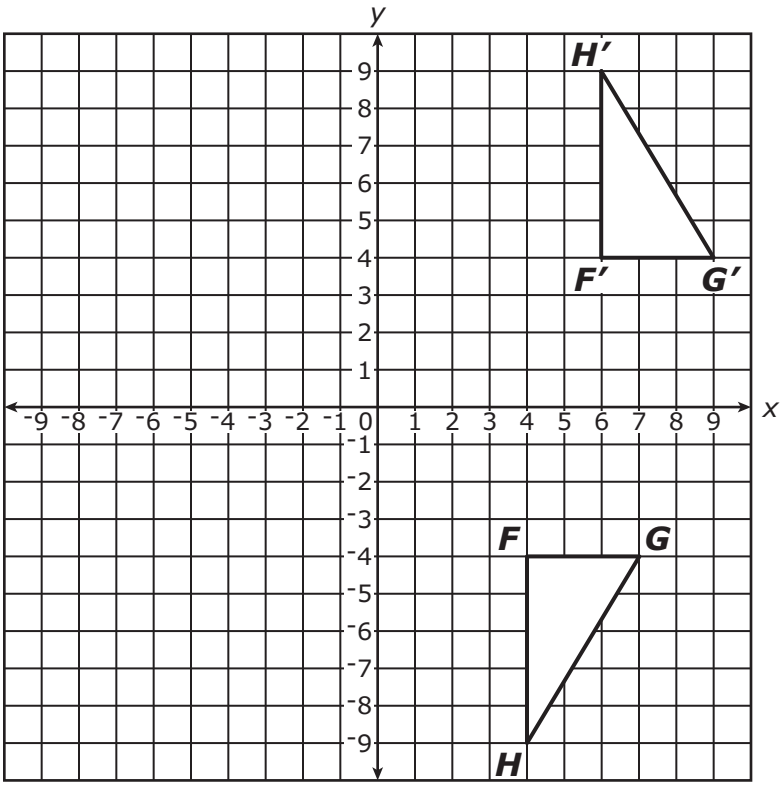
A 2^{21}

B 2^{18}

C 2^8

D 2^5

10 Triangles *FGH* and *F′G′H′* are shown on the coordinate plane. Triangle *F′G′H′* is the image of triangle *FGH* after two transformations.



Which two transformations could have been performed on triangle *FGH* to result in triangle *F′G′H′*?

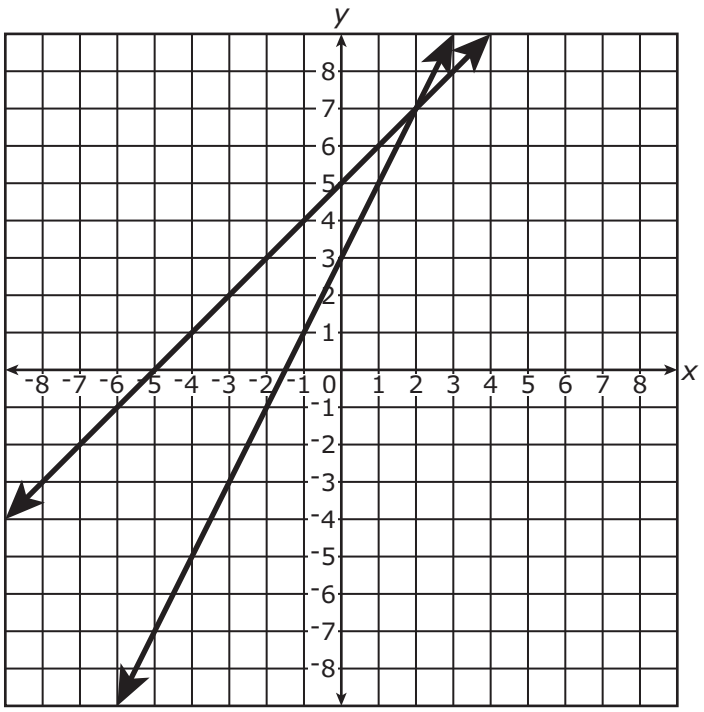
A a 90-degree counterclockwise rotation centered at the origin followed by a translation 2 units to the right

B a 90-degree clockwise rotation centered at the origin followed by a translation 2 units to the right

C a translation 2 units to the right followed by a reflection across the *x*-axis

D a translation 2 units to the right followed by a reflection across the *y*-axis

11 The graph of the system of equations $\begin{cases} y = 2x + 3 \\ y = x + 5 \end{cases}$ is shown on the coordinate plane.



What is the solution to the system of equations?

A The solution is (2, 7) because the solution to the system must satisfy both equations simultaneously.

B The solution is (1, 6) because the solution to the system must satisfy one equation or the other equation.

C The solution is (3, 5) because the solution to the system must represent the *y*-intercepts of both equations.

D The solution is (−1.5, −5) because the solution to the system must represent the *x*-intercepts of both equations.

12 Which fraction is the **best** estimate for the value of $\frac{\sqrt{65}}{\sqrt{122}}$?

A $\frac{1}{2}$

B $\frac{33}{61}$

C $\frac{2}{3}$

D $\frac{8}{11}$

13 What value of x satisfies the equation $5(x - 6) - 2(x + 3) = 12$?

Enter your answer in the space provided.

14 Which sets of ordered pairs represent functions?

Select **all** that apply.

A {(1, 2), (2, 3), (3, 4)}

B {(2, 1), (2, 3), (4, 1)}

C {(3, 1), (4, 2), (5, 3)}

D {(6, 1), (6, 2), (6, 3)}

E {(7, 1), (8, 3), (9, 3)}

STOP

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GO ON TO NEXT PAGE

Section 2
(Calculator)

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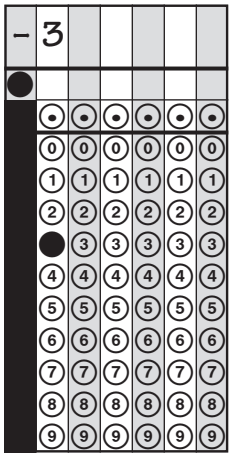

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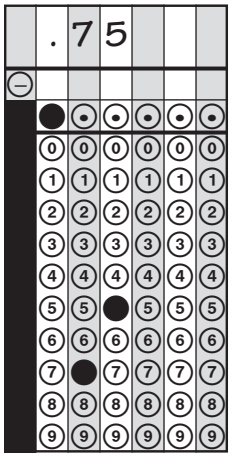


1 A person purchased backpacks and notebooks to donate to a school. The person purchased a total of 10 items. Each backpack cost $25.75 and each notebook cost $4.25. The total cost of the items was $150. This situation can be represented by a system of equations with a unique solution.

What does the solution to the system of equations represent in this context?

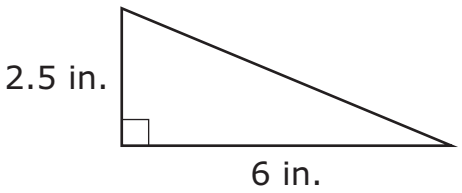
A the cost of all the backpacks

B the cost of all the notebooks

C the total amount of money spent on the items

D the number of backpacks and notebooks purchased

2 A right triangle is shown, with two side lengths given in inches.



What is the length, in inches, of the third side of the right triangle?

A 3.9

B 4.1

C 6.5

D 8.5

3 Consider the function defined by $y = 2x - 5$.

Which statements can be used to justify that the function is linear?

Select **all** that apply.

A The coefficient of x is greater than 1.

B The function has a constant slope of 2.

C The function has a negative y–intercept.

D The graph of the function is a straight line.

E The equation is written in the form $y = mx + b$.

4 A teacher wrote the two different systems of equations shown and labeled them System J and System K.

System J: $\begin{cases} 2x + 5y = 16 \\ y = -1 \end{cases}$

System K: $\begin{cases} 3x + 4y = 10 \\ 6x + 8y = 5 \end{cases}$

Solve System J and System K using any method. Show or explain how you solved each system.

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

5 The cost for a person to park in a parking garage can be represented by a linear function. The information about two different people who parked in the garage is listed.

- The first person parked in the garage for 4 hours and paid $23.
- The second person parked in the garage for 6 hours and paid $33.

Which equation represents this situation, where y represents the total amount paid, in dollars, for parking in the garage for x hours?

A $y = 3x + 5$

B $y = 4x + 7$

C $y = 5x + 3$

D $y = 6x - 3$

6 A school club ordered medium pizzas and large pizzas for a club meeting. Each medium pizza cost $10 and was shared by 3 students. Each large pizza cost $12 and was shared by 4 students. There are 26 students in the club, and the club spent $80 on the pizzas.

Which system of equations models this situation, where x represents the number of medium pizzas and y represents the number of large pizzas?

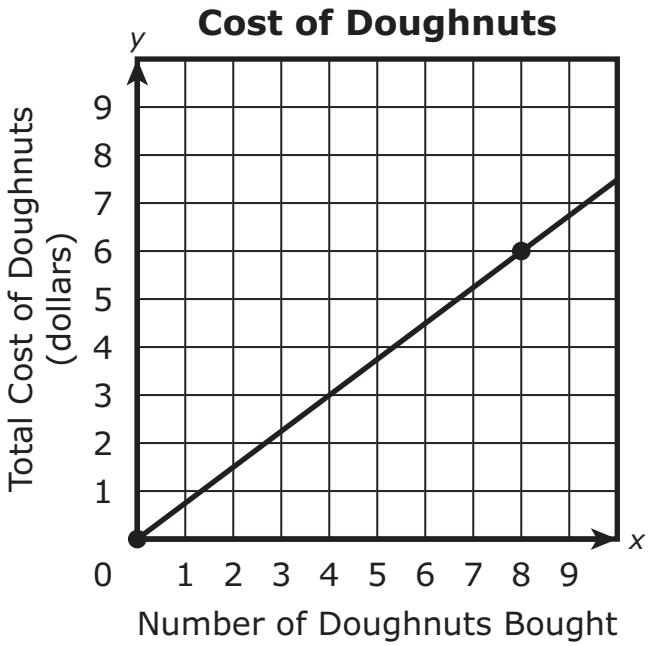
A $\begin{cases} 10x + 12y = 80 \\ x + y = 26 \end{cases}$

B $\begin{cases} 10x + 12y = 80 \\ 3x + 4y = 26 \end{cases}$

C $\begin{cases} \frac{10}{3}x + 3y = 80 \\ x + y = 26 \end{cases}$

D $\begin{cases} \frac{10}{3}x + 3y = 80 \\ 3x + 4y = 26 \end{cases}$

7 The graph shown models the proportional relationship between the number of doughnuts a customer buys at a bakery and the total cost of the doughnuts.



What is the cost of each doughnut?

A $0.75

B $1.00

C $1.33

D $2.00

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GO ON TO NEXT PAGE

Section 3
(Calculator)

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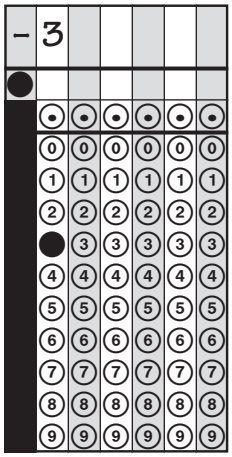

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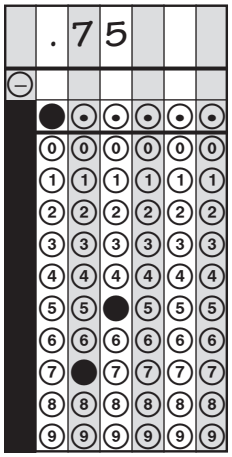
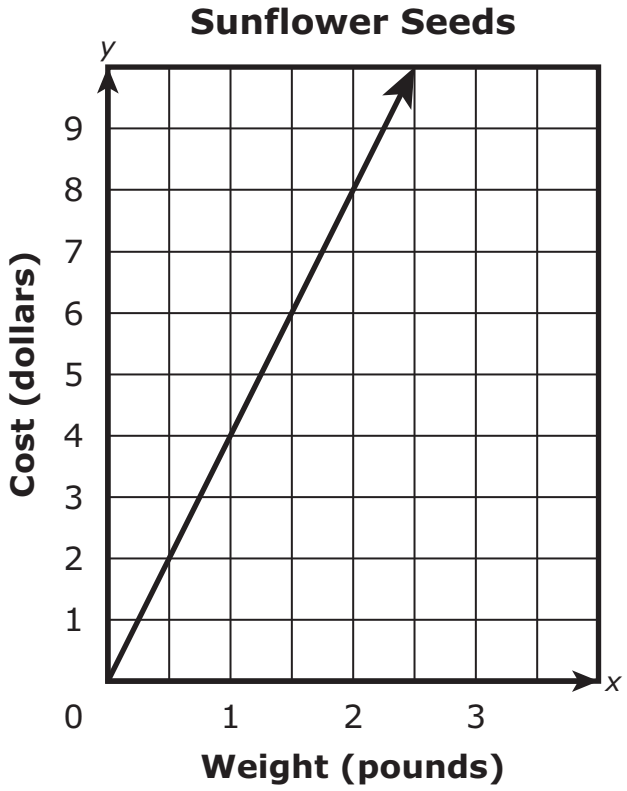


1 A grocery store sells pumpkin seeds and sunflower seeds by the pound.

The equation $y = 6x$ models the relationship between y, the cost, in dollars, and x, the weight, in pounds, of the pumpkin seeds.

The graph shows the relationship between the cost, in dollars, and the weight, in pounds, of the sunflower seeds.



A customer purchased seeds and paid $12 for the pumpkin seeds and $20 for the sunflower seeds.

Which statement is true?

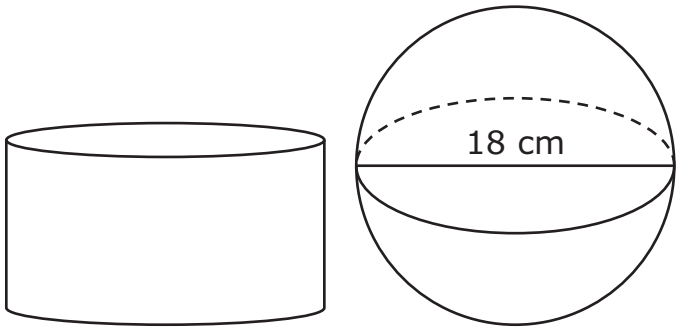
A The customer purchased 2 more pounds of sunflower seeds than pumpkin seeds.

B The customer purchased 3 more pounds of sunflower seeds than pumpkin seeds.

C The customer purchased 2 more pounds of pumpkin seeds than sunflower seeds.

D The customer purchased 3 more pounds of pumpkin seeds than sunflower seeds.

2 A cylinder and a sphere are shown. The diameter, in centimeters, of the sphere is given.



- The radius of the cylinder is the same as the radius of the sphere.
- The volume of the cylinder is the same as the volume of the sphere.

What is the height, in centimeters, of the cylinder?

Enter your answer in the space provided.

3 Student J and Student K are both reading the same book for a class assignment. Student J reads 20 pages of the book each day. Student K starts reading 2 days after Student J starts reading, and Student K reads 30 pages of the book each day.

- Define one variable **and** write an equation that represents the information given.
- Determine the number of days after Student J starts reading when both students will have read the same number of pages of the book. Show your work or explain how you found your answer.

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

4 The graph of linear function K passes through the points at (0, 4) and (2, 0).

Function L is represented by the equation $y = 3x + 2$.

Which statement is true about the two functions?

A The y-intercept of function K is equal to the y-intercept of function L.

B The y-intercept of function K is greater than the y-intercept of function L.

C The rate of change of function K is equal to the rate of change of function L.

D The rate of change of function K is greater than the rate of change of function L.

5 The amounts that two plumbers charge for their services are described.

- The first plumber charges a fixed fee of $40 for house calls and $15 per hour of work.
- The second plumber charges a fixed fee of $30 for house calls and $19 per hour of work.

For what number of hours of work do the first plumber and the second plumber charge the same total amount?

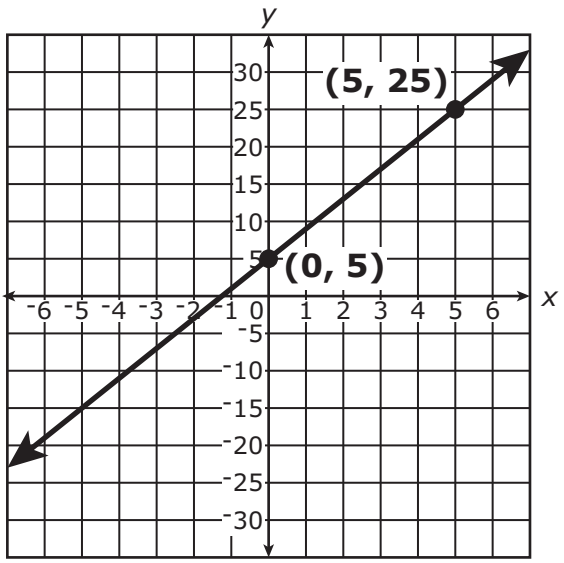
Enter your answer in the space provided.

6 The vertices of $\triangle PQR$ are $P(6, 1)$, $Q(3, 5)$, and $R(11, 11)$. The length of segment PR is $\sqrt{125}$ units.

Use the coordinates and geometric reasoning to show that $\triangle PQR$ is a right triangle. Explain your reasoning and show your work.

Enter your explanation and your work in the space provided.

7 The graph of a line is shown on the coordinate plane.



A student claims that the line will pass through the point at (10, 50) on the coordinate plane.

Which statement **best** explains whether the student's claim is true or false?

A The student's claim is true because the equation of the line is $y = 5x$, and 50 is equal to $5 \cdot 10$.

B The student's claim is true because the equation of the line is $y = \frac{9}{2}x + 5$, and 50 is equal to $\frac{9}{2} \cdot 10 + 5$.

C The student's claim is false because the equation of the line is $y = 4x + 5$, and 10 is not equal to $4 \cdot 50 + 5$.

D The student's claim is false because the equation of the line is $y = 4x + 5$, and 50 is not equal to $4 \cdot 10 + 5$.

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GO ON TO NEXT PAGE

Section 4
(Calculator)

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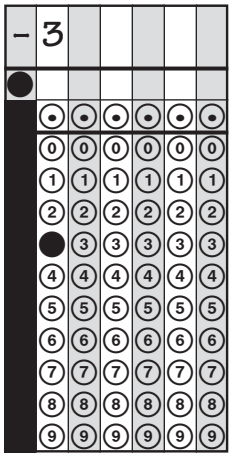

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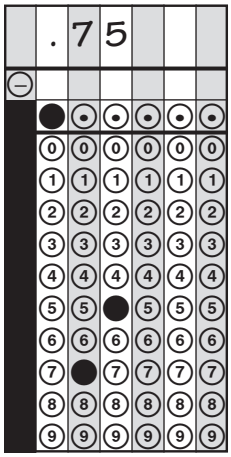


1 An office manager collected information about the ages of the employees who work at the office. The information is summarized in the two-way table shown.

Ages of Employees

Type of Employee	Younger than 30 Years Old	30 Years Old or Older
Part-Time	17	33
Full-Time	8	42

What percentage of the part-time employees are 30 years old or older?

A 33%

B 52%

C 66%

D 79%

2 A system of equations is shown.

$$\begin{cases} y = 5x + 7 \\ y = -3x - 1 \end{cases}$$

What is the solution to the system of equations?

A $(-1, 2)$

B $(1, -4)$

C $(1, 12)$

D $(2, -1)$

3 A drama club is selling tickets to a play. The cost of each adult ticket is $8, and the cost of each student ticket is $4. One customer purchased 8 tickets and spent a total of $56.

The system of equations shown can be used to model this situation.

$$\begin{cases} y = 8 - x \\ 8x + 4y = 56 \end{cases}$$

Which equation can be used to find x, the number of adult tickets the customer purchased?

A $8x + 4(8 - x) = 56$

B $8(8 - x) + 4y = 56$

C $8x + 4y - 56 = 8 - x$

D $8x + 4y = 56 + 8 - x$

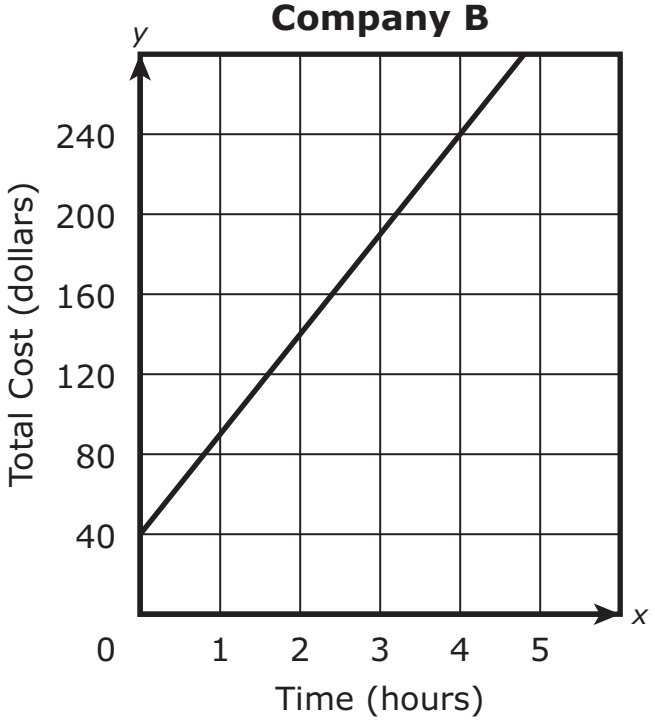
4 A waterslide will be rented from company A or company B. Both companies charge a one-time delivery fee and an hourly rate to rent the waterslide.

The table and graph show the total cost, in dollars, to rent the waterslide for different numbers of hours from the two companies.

Company A

Time (hours)	0	2	3	5
Total Cost (dollars)	60	150	195	285

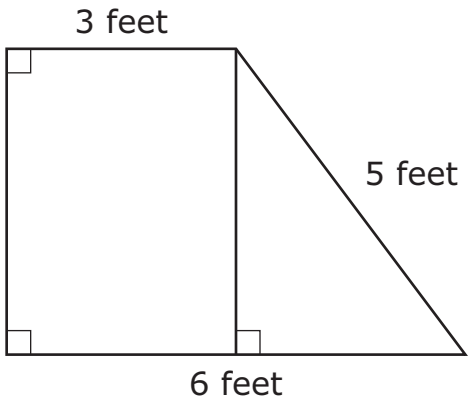
Company B



- Determine the hourly rates and one-time delivery fee for each company.
- Determine which company would charge a lower price to rent a waterslide for 6 hours.

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

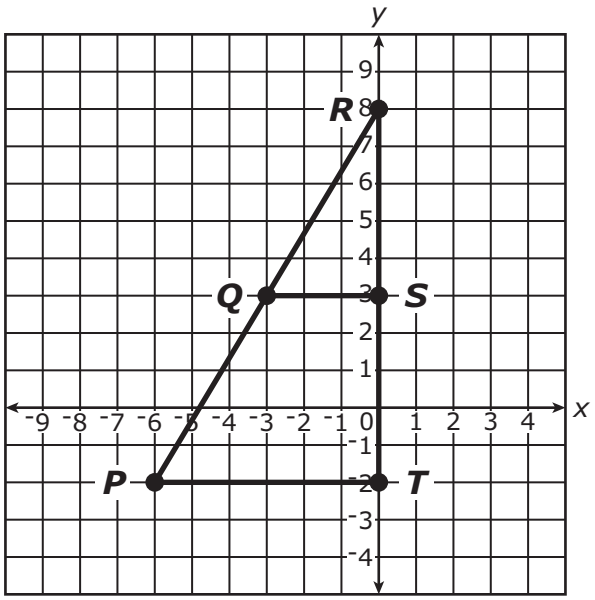
5 The figure shows the front side of a store sign and its dimensions, in feet. The store owner will paint the entire front side of the sign.



What is the area, in square feet, of the front side of the sign?

Enter your answer in the space provided.

6 Triangle *PRT* and triangle *QRS* are shown on the coordinate plane. Points *P*, *Q*, and *R* all lie on the same line, and points *T*, *S*, and *R* all lie on the *y*-axis. The vertices of both triangles have integer coordinates.



Which statement about the slopes is true?

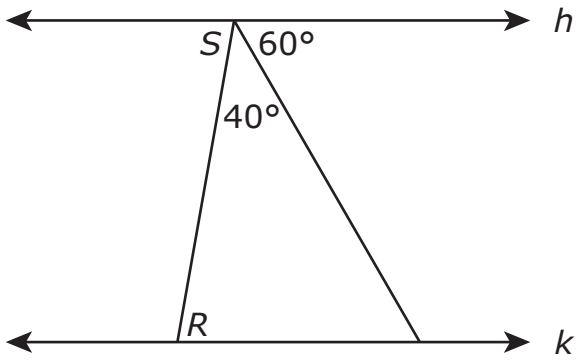
A The slopes of $\overline{PR}$ and $\overline{QR}$ are equal because $\frac{PT}{QS} = \frac{SR}{TR}$.

B The slopes of $\overline{PR}$ and $\overline{QR}$ are equal because $\frac{TR}{TP} = \frac{SR}{SQ}$.

C The slope of $\overline{PR}$ is less than the slope of $\overline{QR}$ because $\frac{PT}{QS} < \frac{SR}{TR}$.

D The slope of $\overline{PR}$ is greater than the slope of $\overline{QR}$ because $\frac{TR}{TP} > \frac{SR}{SQ}$.

7 The figure shows parallel lines h and k intersected by two transversals.



A student claims that the $m\angle R = 80°$.

Which statement about the claim is true?

A The claim is incorrect because $m\angle S = 180° \div 3 = 60°$, and since $\angle R$ and $\angle S$ are corresponding angles, $m\angle R = 60°$.

B The claim is incorrect because $m\angle S = 60° + 40° = 100°$, and since $\angle R$ and $\angle S$ are alternate interior angles, $m\angle R = 100°$.

C The claim is correct because $m\angle S = (360° \div 3) - 40° = 80°$, and since $\angle R$ and $\angle S$ are corresponding angles, $m\angle R = 80°$.

D The claim is correct because $m\angle S = 180° - (40° + 60°) = 80°$, and since $\angle R$ and $\angle S$ are alternate interior angles, $m\angle R = 80°$.

STOP

You have come to the end of Section 4 of the test. Review your answers from Section 4 only.

P

8-MATH

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