CCSS Math Samples — Grade 8

1. Separate the numbers below into the most specific of these groups:

   integers

   rational numbers

   irrational numbers

   real numbers

$\frac{8}{2}$	$\lvert -7.3 \rvert$	$5\frac{2}{7}$
$0.303003000\ldots$		π
$\sqrt{25}$	0.4	$-3\sqrt{8}$

2. Rory's uncle, a math teacher, will give Rory a $5 bill if Rory can figure out which of these has a value closest to 5. Which one should Rory choose?

   A. $\sqrt[4]{626}$ B. $\sqrt[5]{3179}$

   C. $\sqrt[3]{130}$ D. $\sqrt[6]{1490}$

3. Use scientific notation to simplify the expression.

$$\frac{6.4 \times 10^4}{(8.0 \times 10^4)(2.0 \times 10^3)}$$

   A. 1.6×10^{-1} B. 4.0×10^{-2}

   C. 4.0×10^{-3} D. 4.0×10^{-4}

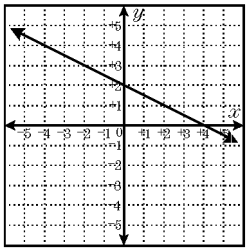
4. Solve: $5[x - 2(x - 1)] = x + 13$

   A. $x = -2$ B. $x = -\frac{1}{2}$

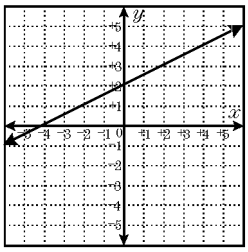
   C. $x = \frac{1}{2}$ D. $x = 1$

5. Which of the following is the graph of $-2x + 4y = 8$?

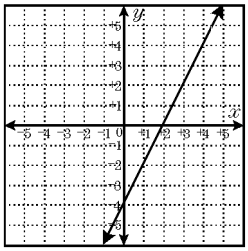
   A.



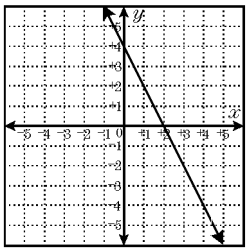
   B.



   C.



   D.



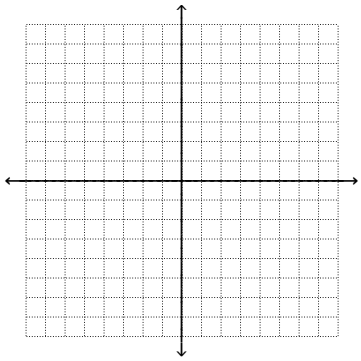
6. Erik has 8 sacks of flour. Some of his sacks weigh 3 pounds, and the others weigh 7 pounds. The total weight of his flour is 36 pounds. How many 7-pound sacks does he have?

   A. 3 sacks B. 4 sacks

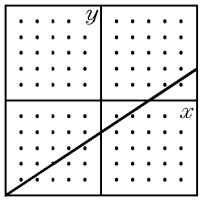
   C. 5 sacks D. 6 sacks

7. For the equation $y = x + 3$, fill the table with ordered pairs, then graph.

x	y



8. Determine the equation of the line.



A. $2y - x = -4$

B. $2y - x = 4$

C. $y - 4x = 2$

D. $y + 2x = -2$

9. If the y-intercept of the graph of $y = -4x - 2$ is changed to 5 but the x-intercept remains the same, what is the equation of the new graph?

A. $y = 5x - 2$ B. $y = \frac{1}{2}x + 5$

C. $y = 10x + 5$ D. $y = -\frac{4}{5}x - 5$

10. Plot the following points: $A(2, 3)$, $B(7, 3)$, $C(7, 8)$ and $D(2, 8)$

a) What is the equation of the line joining points A and C?

b) What is the equation of the line joining points B and D?

c) Are the lines in parts (a) and (b) perpendicular?

d) At what point do the diagonals intersect?

11. Jack's Table Rental charges a $25.00 deposit and then $6.00 per table. Party Company charges a $35.00 deposit but only $4.50 per table. Which company should be used if 9 tables need to be rented? Show your solution by drawing a graph, solving an equation, or making a table.

12. Consider the following points in the x and y plane:

$(2, 3)$, $(4, 1)$, $(-1, 2)$, $(3, 3)$, $(-2, 4)$

Which statement is true about the relation between x and y?

A. x is a function of y

B. y is a function of x

C. x is a function of y and y is a function of x

D. x is not a function of y and y us not a function of x

13. The table shows recommended heart rates during exercise. In the table, a is a person's age (years) and R is the recommended heart rate (beats per minute):

a	R
10	180
20	170
30	160
40	150

Which equation shows the relationship between age and recommended heart rate?

A. $R = -10a + 190$

B. $R = -a + 190$

C. $R = a + 160$

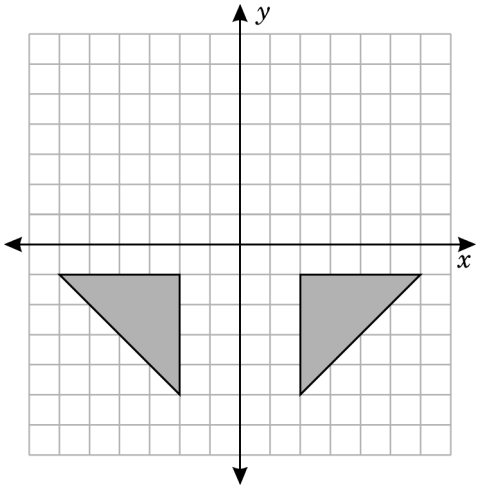
D. $R = 10a + 60$

14. The diagram shows a triangle that has been reflected about the *y*-axis from the fourth quadrant to the third quadrant.

a) On the graph, draw a reflection of the triangle about the *x*-axis from the fourth quadrant to the first quadrant.

b) Now rotate the triangle in the third quadrant 90° clockwise around the origin. Repeat the operation with the new triangle: rotate it 90° clockwise around the origin. How many different triangles show up in the first quadrant?

c) Show or explain why the two 90° rotations have the same result as the two reflections. Since rotations and reflections do not always have the same result, what is special about this particular triangle?



15. Each packing-crate in a warehouse contains 16 basketballs, and there are 4 basketballs that are not in a crate. Which equation shows the relationship between the number of basketballs, *b*, and the number of crates in the warehouse, *c*?

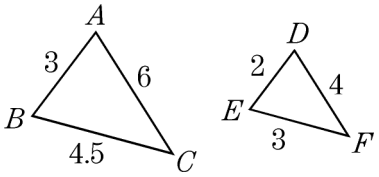
A. $c = \frac{4}{b}$

B. $c = \frac{b}{16} + 4$

C. $b = c + 4$

D. $b = 16c + 4$

16. Study the diagram.



Select the statement that is *incorrect*.

A. $\frac{DE}{AB} = \frac{EF}{AC}$

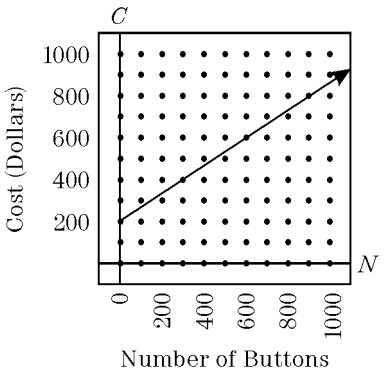
B. $\frac{AC}{DF} = \frac{3}{2}$

C. $\frac{EF}{BC} = \frac{2}{3}$

D. $\frac{AB}{BC} = \frac{DE}{EF}$

17. The total cost to manufacture buttons involves a one-time setup cost plus a charge for each button produced. The graph shows the total cost for various numbers of buttons.

What is the cost to manufacture each button after the setup cost has been covered (paid off)?



A. $0.50 B. $0.67

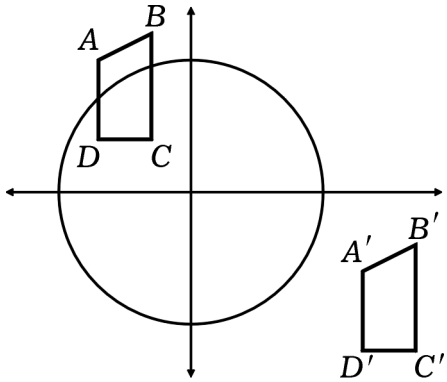
C. $1.00 D. $1.33

18. Make up a word problem that the following setup could represent.

smaller number → x
larger number → $2x + 9$

Therefore: $5(2x + 9) - (4x) = 21$

19. The figure shows a congruence transformation for trapezoid $ABCD$, where $A = (-4, 6)$ and $A' = (8, -3)$.



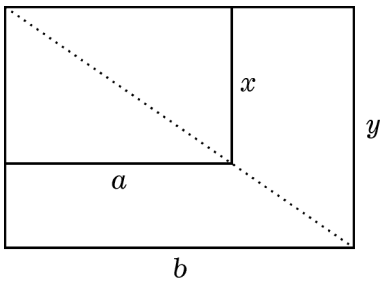
If the circle, whose center O is at the origin, is transformed the same way as the trapezoid, what are the coordinates of O'?

A. $(12, -9)$ B. $(-4, -3)$

C. $(6, 8)$ D. $(4, 3)$

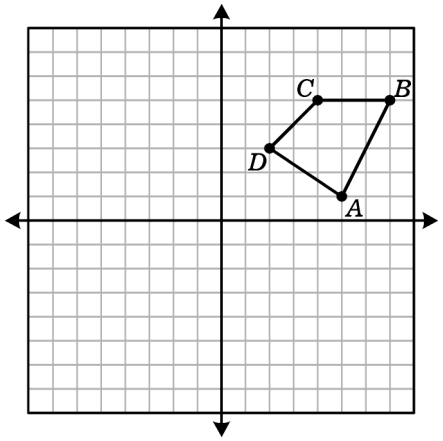
20. In the figure, the two rectangles are similar.

If $a = 20$, $b = 32$ and $x = 12$, what is the value of y?



A. 7.5 B. 16 C. 19.2 D. $53\frac{1}{3}$

21. Quadrilateral $A'B'C'D'$ is the image of quadrilateral $ABCD$ after a translation of 4 units left and 3 units down. What are the coordinates of quadrilateral $A'B'C'D'$?



A. $(1, 4), (3, 8), (0, 8), (-2, 6)$

B. $(5, -2), (7, 2), (4, 2), (2, 0)$

C. $(1, -2), (3, 2), (0, 2), (-2, 0)$

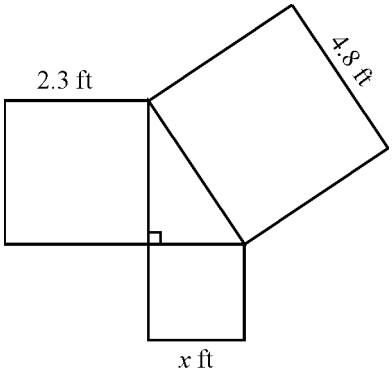
D. $(1, 1), (3, 5), (0, 5), (-2, 3)$

22. In triangle ABC, the measure of $\angle A$ is y, the measure of $\angle B$ is $y + 20$, and the measure of an exterior angle at C is 120°. Find y.

A. 100° B. 50°

C. 30° D. 60°

23. Use the known lengths of the squares that form the right triangle to find the length x of the third square.



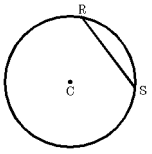
A. 4.2 ft B. 5.3 ft

C. 5.9 ft D. 6.2 ft

24. Find the shortest distance from the center of the circle, C, to the line RS. The length of segment RS is 8 in. The diameter of the circle is 20 in.

A. 2 B. $2\sqrt{7}$

C. $2\sqrt{21}$ D. 10

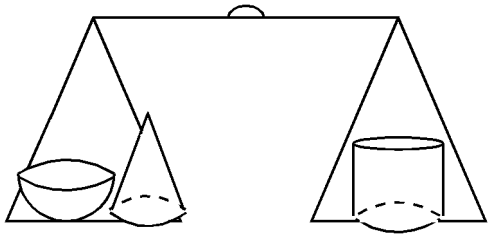


25. Monica and Jan take part in a scavenger hunt. They begin the hunt at the same starting point. Monica walks 30 m north, then 70 m east to find her first treasure. Jan walks 50 m south, then 20 m west and stops. How far are the girls from each other?

A. $\sqrt{500}$ m B. $\sqrt{8700}$ m

C. $\sqrt{14500}$ m D. $\sqrt{16900}$ m

26. A solid hemisphere $\left(V = \frac{2}{3}\pi r^3\right)$, and a solid cone $\left(V = \frac{1}{3}(\text{Area of base} \times \text{height})\right)$ are on one side of a balance. A solid cylinder $(V = \text{Area of Base} \times \text{height})$ is on the other side. All have the same radius and are made of the same material. The cone and the cylinder are the same height. Which side is heavier?



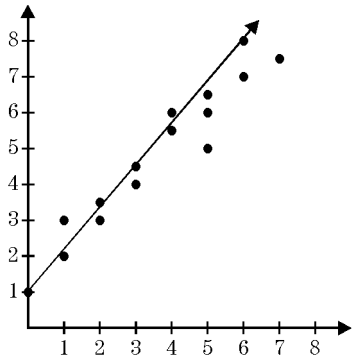
A. The cylinder side is much heavier.

B. The cylinder side is slightly heavier.

C. The cylinder side is lighter.

D. The weights are the same.

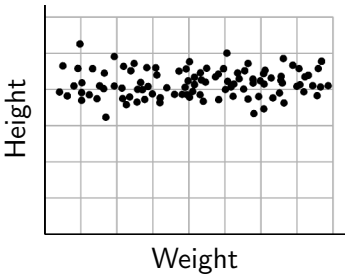
27. The scatterplot needs its line of best fit to be adjusted. If the line shown has a slope of $\frac{7}{6}$, what should the slope be changed to in order to get the best-fitting line?



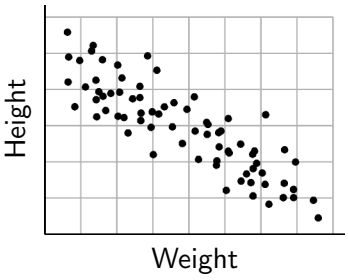
A. $-\frac{7}{6}$ B. $-\frac{1}{2}$ C. $\frac{1}{3}$ D. 1

28. A teacher graphed the weights and heights of students in the class. Which of these is the *most probable* scatterplot the teacher created?

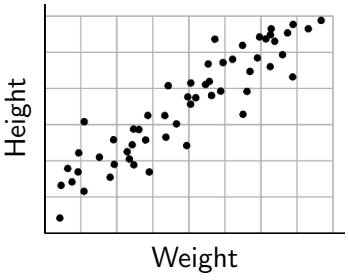
A.



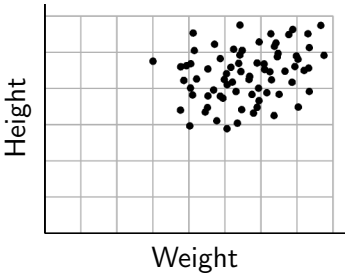
B.



C.

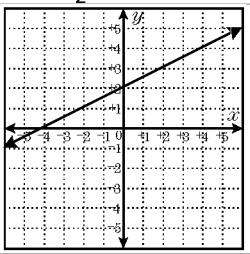


D.



Problem-Attic Sample Document
all items from CCSS Math Database

Grade 8

Num	Scoring	Standard	Answer
1		8.NS.01	[task]
2	A	8.NS.02	$\sqrt[4]{626}$
3	D	8.EE.04	4.0×10^{-4}
4	B	8.EE.07B	$x = -\frac{1}{2}$
5	B	8.F.03	
6	A	8.EE.08C	3 sacks
7		8.F.03	[answers vary]
8	A	8.F.04	$2y - x = -4$
9	C	8.EE.06	$y = 10x + 5$
10		8.EE.08A	$y = x + 1$; $y = -x + 10$; yes; $(4.5, 5.5)$
11		8.EE.08C	Party Company
12	B	8.F.01	y is a function of x
13	B	8.F.04	$R = -a + 190$
14		8.G.01	Triangle is isoceles.
15	D	8.F.04	$b = 16c + 4$
16	A	8.G.04	$\frac{DE}{AB} = \frac{EF}{AC}$
17	B	8.SP.03	\$0.67
18		8.EE.07B	[answers vary]
19	A	8.G.03	$(12, -9)$
20	C	8.G.04	19.2
21	C	8.G.03	$(1, -2)$, $(3, 2)$, $(0, 2)$, $(-2, 0)$
22	B	8.G.05	50°
23	A	8.G.07	4.2 ft
24	C	8.G.07	$2\sqrt{21}$
25	C	8.G.08	$\sqrt{14500}$ m
26	D	8.G.09	The weights are the same.
27	D	8.SP.03	1

28	D	8.SP.01