

8th Grade Mathematics

This Test Review Booklet was designed for Grade 8 Mathematics Assessment Test. It provides examples of the format and types of questions that may be on the actual test as administered by the State Education Department. We have separated our review tests into two sections:

The actual test has three books, administered over three days.

- Part 1: 28 multiple choice questions
- Part 2: 27 multiple choice questions
- Part 3: 6 short response questions
4 extended response questions

For a complete description of restrictions see the NY State Education website: www.nysed.gov

Special Thanks To:

Luke Masouras - Examgen Inc.

Syracuse, NY • www.EXAMgen.com

For providing technical guidance and development of the test questions

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Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

FORMULAS

Triangle

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

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

Cylinder

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

Sphere

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

Cone

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

Pythagorean Theorem

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

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TEST 1

Part 1

1 What is the value of $\sqrt{1}$?

- A 0
- B 1
- C $\frac{1}{2}$
- D -1

1 _____

2 What is 48,200 written in scientific notation?

- A 4.82×10^3
- B 4.82×10^4
- C 4.82×10^2
- D 4.82×10^5

2 _____

3 What is the sum of 6×10^3 and 3×10^2 ?

- A 6.3×10^3
- B 9×10^5
- C 9×10^6
- D 18×10^5

3 _____

4 Which of the following equations has an infinite number of solutions?

- A $3(2x + 1) = 2(1 + 3x) + 1$
- B $3(2x + 1) = 2(1 + 3x) - 1$
- C $3(2x - 1) = 2(1 + 3x) - 1$
- D $3(2x + 1) = 2(3 + 2x) - 3$

4 _____

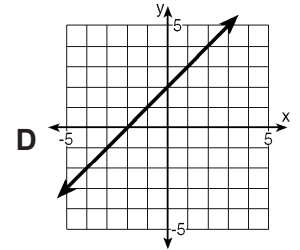
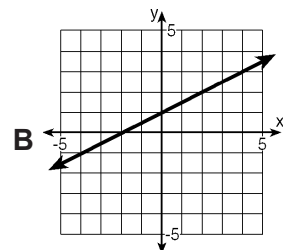
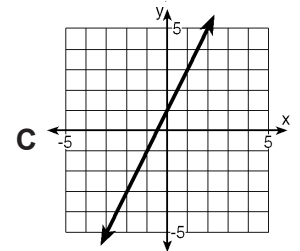
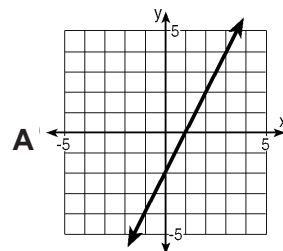
5 Solve the given system of equations by substitution.

$$y = x$$
$$x + y = 18$$

- A (0, 0)
- B (14, 4)
- C (10, 8)
- D (9, 9)

5 _____

6 Which of the following is the correct graphic representation of the linear function $f(x) = 2x + 1$?



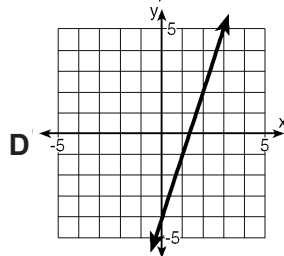
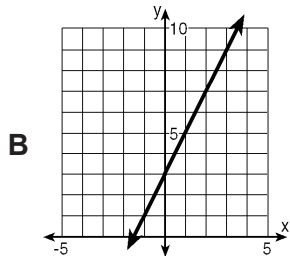
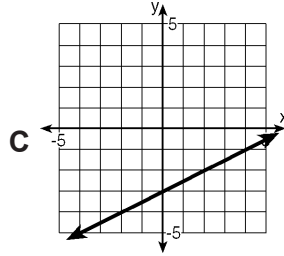
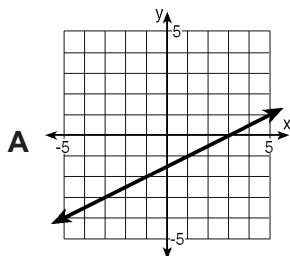
6 _____

7 What is the maximum number of times that the graph of a function can intersect the y-axis?

- A 3
- B 2
- C 1
- D 0

7 _____

8 Which of the following is the correct graphic representation of the linear function $f(x) = 3x - 4$?



8 _____

9 Two congruent angles that are supplementary must be _____ angles.

- A right
- B straight
- C acute
- D obtuse

9 _____

10 Rentals for a certain movie were graphed on the chart below.



Which of the following statements best describes the number of rentals over the number of weeks?

- A Rentals were constant over the time period.
- B Rentals started at a maximum and decreased to zero.
- C Sales started high, decreased and leveled off, sharply increased to a peak, and quickly dropped to zero.
- D Rentals started high, decreased to a minimum, increased to a maximum, and fell to zero.

10 _____

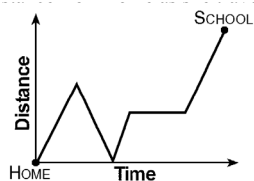
11 What is an equation of the linear function that represents the following table of values?

x	y
2	4
3	6
4	8

- A $f(x) = x - 2$
- B $f(x) = x + 2$
- C $f(x) = -2x$
- D $f(x) = 2x$

11 _____

- 12** The graph below indicates Juanita's distance from home as she travels to school.



Which of the following best describes Juanita's journey to school?

- A** She leaves for school, stops to play with a puppy, continues on her way, stops at the market to buy a bottle of juice, and arrives at school.
- B** She leaves for school, returns home to retrieve a homework assignment, leaves for school again, waits for a train to pass, and arrives at school.
- C** She runs out the door, slows down to pick up a dollar, starts running again, stops to buy some candy, and runs to school.
- D** She dashes out the door, slows her pace down, starts skipping, jogs at a steady pace, and sprints to school. 12 _____

- 13** The area of a storeroom with a rectangular floor is 2,800 square yards. The perimeter of the storeroom floor is 220 yards. Which system of equations will determine the length (ℓ) and the width (w) of the storeroom floor?

- A** $\ell + w = 220$ and $\ell^2 + w^2 = 2,800$
- B** $\ell w = 2,800$ and $2\ell + 2w = 220$
- C** $\ell w = 2,800$ and $2\ell + w = 220$
- D** $\ell w = 220$ and $2\ell + 2w = 2,800$ 13 _____

14 $3^4 \cdot 3^7 =$

- A** 11^3
- B** 3^3
- C** 3^{11}
- D** 9^{11}

14 _____

- 15** What is the value of $\frac{6.3 \times 10^8}{3 \times 10^4}$ in scientific notation?

- A** 2.1×10^4
- B** 2.1×10^{-2}
- C** 2.1×10^{-4}
- D** 2.1×10^2

15 _____

- 16** Two congruent angles are supplementary. The measure of each angle is _____.

- A** 90°
- B** 45°
- C** 180°
- D** 60°

16 _____

- 17** What is an equation of a linear function that represents the following table of values?

x	y
3	4
4	5
5	6

- A** $f(x) = 2x$
- B** $f(x) = 1 - x$
- C** $f(x) = x - 1$
- D** $f(x) = x + 1$

17 _____

18 $5^2 \cdot 5 =$

- A 25^2
- B 25^3
- C 5^3
- D 5^2

18 _____

19 What is 25,000,000 written in scientific notation?

- A 25×10^6
- B 2.5×10^6
- C 25×10^7
- D 2.5×10^7

19 _____

20 Convert the given expression into scientific notation:

$$\frac{(5 \times 10^9)(8 \times 10^{-2})}{2 \times 10^{-3}} =$$

- A 2×10^6
- B 2×10^9
- C 2×10^5
- D 2×10^{11}

20 _____

21 The cost of traveling an interstate highway is given by the table. What is an equation that can represent this relationship between cost (c) and the number of miles traveled (t)?

Miles	Cost
10	1.46
15	2.16
20	2.86
30	4.26

- A $c = 0.14t + 0.06$
- B $c = 0.14t + 6$
- C $c = 0.15t$
- D $c = 0.10t + 0.10$

21 _____

22 A star is 3.4×10^8 light years away. In scientific notation, how far away (in light years) is a star that is half the distance?

- A 1.7×10^8
- B 1.7×5^8
- C 3.4×10^4
- D 1.7×10^4

22 _____

23 $7^2 \cdot 7^8 =$

- A 7^{16}
- B 49^{16}
- C 7^{10}
- D 49^{10}

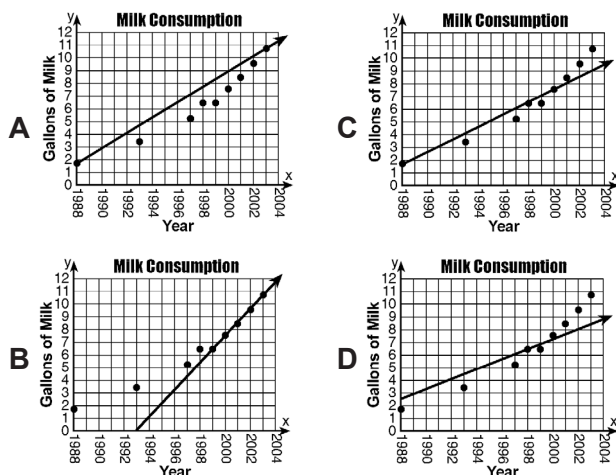
23 _____

- 24** The table below shows the average amount of milk consumed per teenager between the years 1988 and 2003.

Consumption of Milk Per Teenager

Year	1988	1993	1997	1998	1999	2000	2001	2002	2003
Milk Consumption (gallons)	1.8	3.4	5.2	6.5	6.5	7.6	8.4	9.6	10.8

Which of the following graphed lines best models the data?



24 _____

- 25** Irina uses data that she collected on how many minutes she and her friends studied for a test (x) and the grade each received on the test (y). She then determined the equation of best fit to be $y = 0.58x + 44.7$. Use this equation to predict approximately what grade a friend of hers would receive after studying for 75 minutes.

- A 88
- B 44
- C 89
- D 52

25 _____

- 26** What geometric shapes can be drawn from two sets of equivalent parallel sides measuring 3 inches and 4.5 inches?

- A A trapezoid and a parallelogram
- B A rectangle and a parallelogram
- C A rectangle, a parallelogram, and a square
- D A trapezoid, a parallelogram, and a rectangle

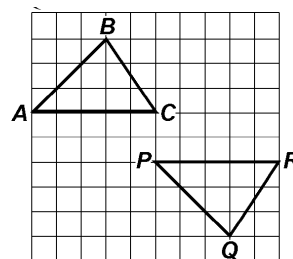
26 _____

- 27** If two angles of a triangle measure 43° and 48° , the triangle is

- A isosceles
- B acute
- C obtuse
- D right

27 _____

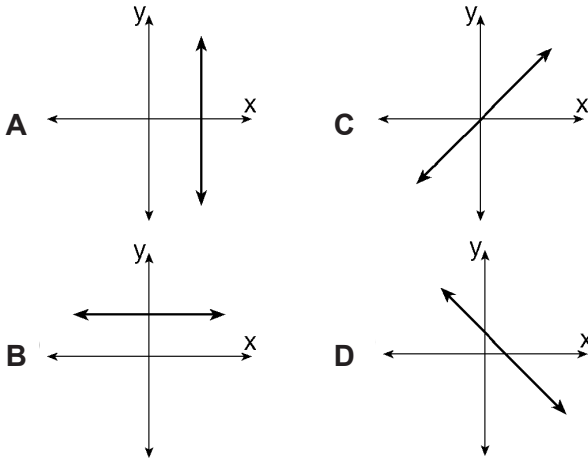
- 28** Triangle ABC is congruent to triangle PQR . Which sequence of congruency transformations maps triangle ABC onto triangle PQR ?



- A a rotation of 90° clockwise about A followed by a translation
- B a translation followed by a line reflection
- C a point reflection followed by a translation
- D a rotation of 90° counterclockwise about A followed by a line reflection

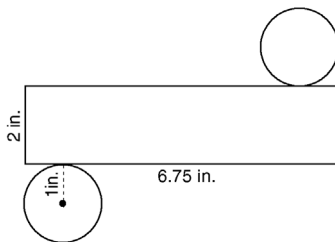
28 _____

- 29** Which one of the following graphs shows the relationship "y is proportional to x"?



29 _____

- 30** The net of a cylinder is shown below.



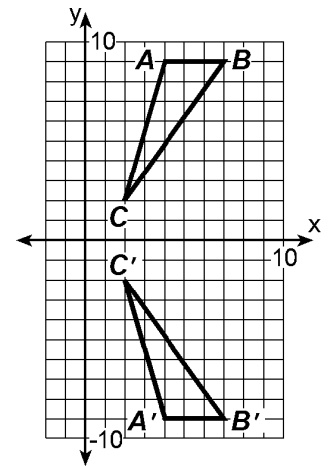
What is the surface area of the cylinder to the nearest square inch?

- A 16 in.²
- B 19 in.²
- C 13 in.²
- D 6 in.²

30 _____

- 31** In the accompanying diagram, $\triangle A'B'C'$ is the image of $\triangle ABC$.

What type of transformation is shown?



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

31 _____

- 32** If the perimeter of an equilateral triangle is 36 inches, what is the perimeter of its image under a dilation with a scale factor of 4?

- A 144 in.
- B 32 in.
- C 8 in.
- D 72 in.

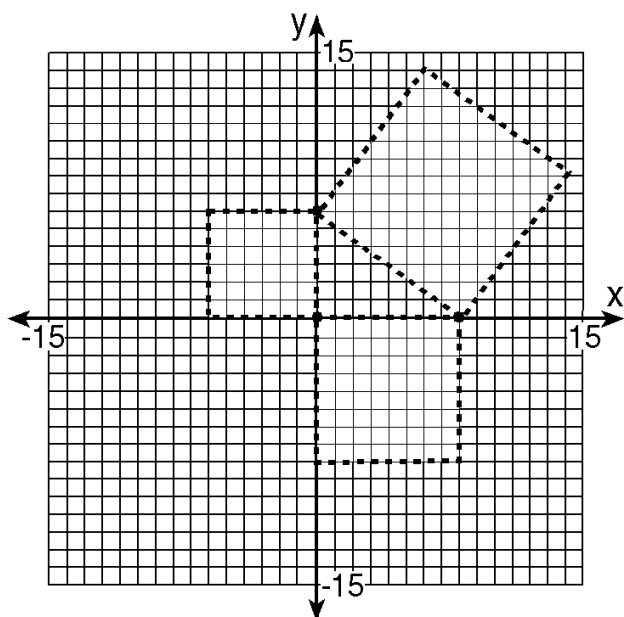
32 _____

- 33** Which of the following properties of an object are not preserved under a line reflection?

- A shape
- B size
- C all of these
- D orientation

33 _____

- 34** What is the area of the largest square graphed below?



- A 10 units²
 B 36 units²
 C 100 units²
 D 64 units²

34 _____

- 35** The graph of the line passing through the points (6, 7) and (4, 2) has a slope of

- A $\frac{2}{5}$
 B $-\frac{5}{2}$
 C $-\frac{1}{2}$
 D $\frac{5}{2}$

35 _____

- 36** Two lines have the following equations:

$$2x + y = 4$$

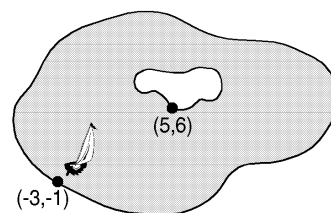
$$3y = 2x - 12$$

At what point do these lines intersect?

- A (1, 2)
 B (3, 10)
 C (6, -8)
 D (3, -2)

36 _____

- 37** In the lake shown below, an island is located at (5, 6). A boat travels in a straight line from (-3, -1) to the island.

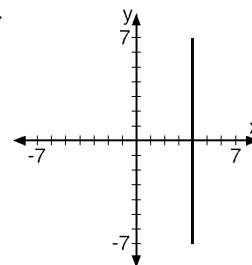


How far does the boat travel? Round the answer to the *nearest tenth* of a unit.

- A 10.6 units
 B 7.8 units
 C 6.7 units
 D 5.4 units

37 _____

- 38** Determine the equation of the line in the given graph.



- A $x = 4$
 B $y = 4x$
 C $x = 4y$
 D $y = 4$

38 _____

- 39** Solve the equation for the given variable.

$$-23 = -16 + 8x$$

- A $-\frac{1}{8}$
 B $-\frac{7}{8}$
 C $\frac{7}{8}$
 D $\frac{1}{8}$

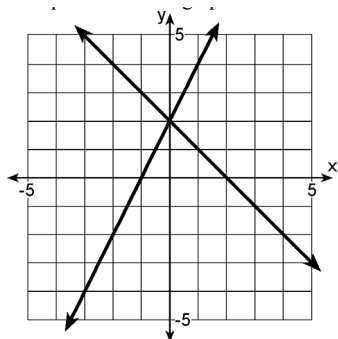
39 _____

- 40** $3z + 26 - 2z = -6$

- A -4
 B -32
 C -20
 D -16

40 _____

- 41** What is the solution of the system of equations whose graphs are shown below?



- A (1, 2)
 B (2, 0)
 C (0, 2)
 D (2, -1)

41 _____

- 42** Which of the following two-dimensional faces can be formed from a cross-section of a cube?

- A rectangle, only
 B square and rectangle, only
 C square, rectangle, and hexagon
 D square, only

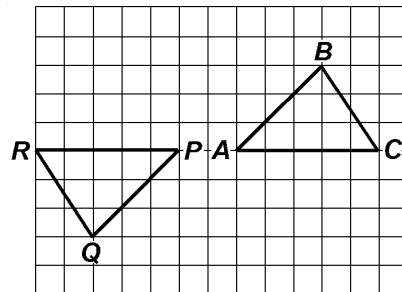
42 _____

- 43** Which of the following properties of an object are preserved under a translation?

- A size, shape, and orientation
 B size and shape, only
 C shape and orientation, only
 D shape, only

43 _____

- 44** Triangle ABC is congruent to triangle PQR .

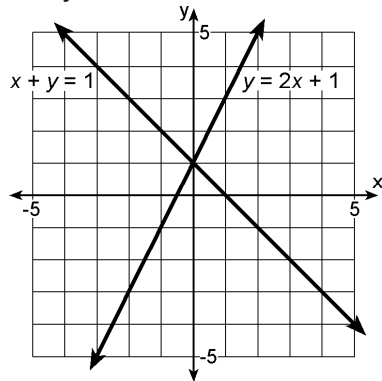


Which sequence of congruency transformations maps triangle ABC onto triangle PQR ?

- A a line reflection followed by a translation
 B a rotation of 90° clockwise about A followed by a translation
 C a point reflection followed by a translation
 D a rotation of 90° counterclockwise about A followed by a line reflection

44 _____

- 51** As shown on the accompanying graph, what is the solution of the system of equations $y = 2x + 1$ and $x + y = 1$?



- A (0, 1)
B (1, 0)
C (0, -1)
D (-1, 0)

51 _____

- 52** James uses data that he collected in a science experiment to calculate a line of best fit. He determines the equation of the line to be $y = 7x + 2.25$.

Use this equation to calculate the value of y when $x = 6$.

- A 42
B 39.75
C 44.25
D 15.25

52 _____

- 53** What equation represents the missing step of the solution below?

(1) $3(x - 14) = 274 - x$

(2) $3x - 42 = 274 - x$

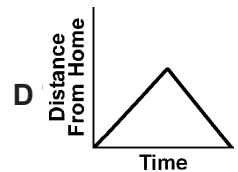
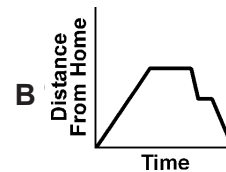
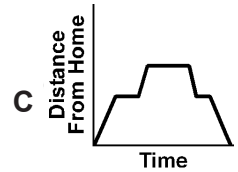
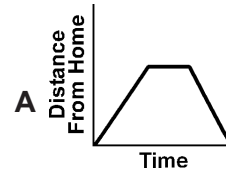
(3)

(4) $x = 79$

- A $2x = 316$
B $4x = 316$
C $4x = 232$
D $2x = 232$

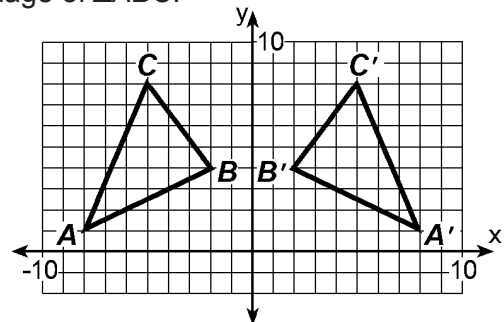
53 _____

- 54** Mr. Adams drove his son up Route 11W to track practice. After watching practice for awhile, he went farther up Route 11W to the supermarket to buy groceries. When he returned to pick up his son, practice was nearly over, so he waited briefly, and then drove home. The graph of which function below correctly depicts this situation?



54 _____

- 55** In the accompanying diagram, $\triangle A'B'C'$ is the image of $\triangle ABC$.



What type of transformation is shown in the illustration?

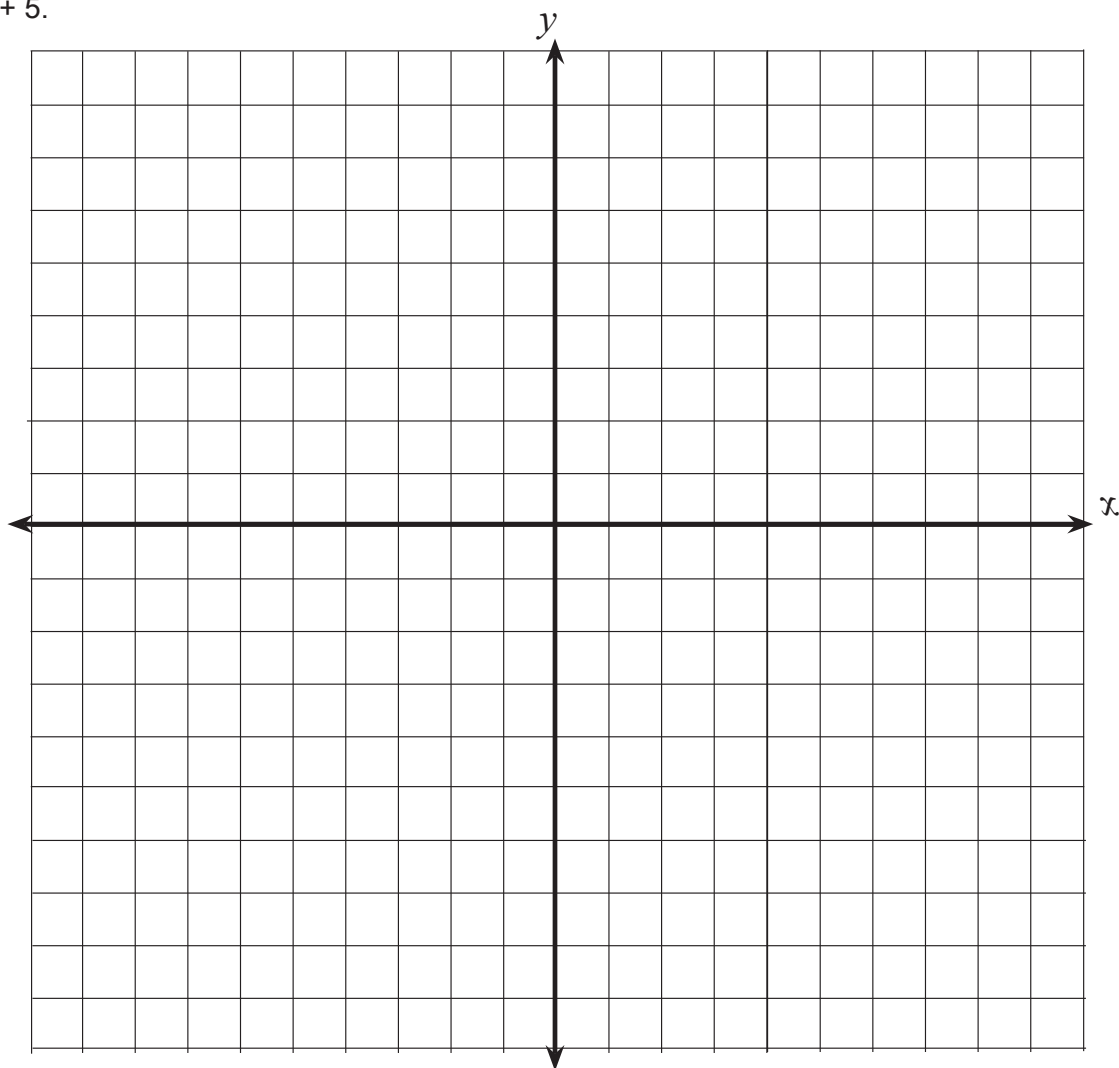
- A rotation
B dilation
C translation
D line reflection

55 _____

PART 2

56 Solve and check: $\frac{3}{8}x - 6 = -24$

57 On the graph below, graph and label the function $f(x) = -x + 5$.



58 Part A

Graph the following system of equations on the coordinate plane below.

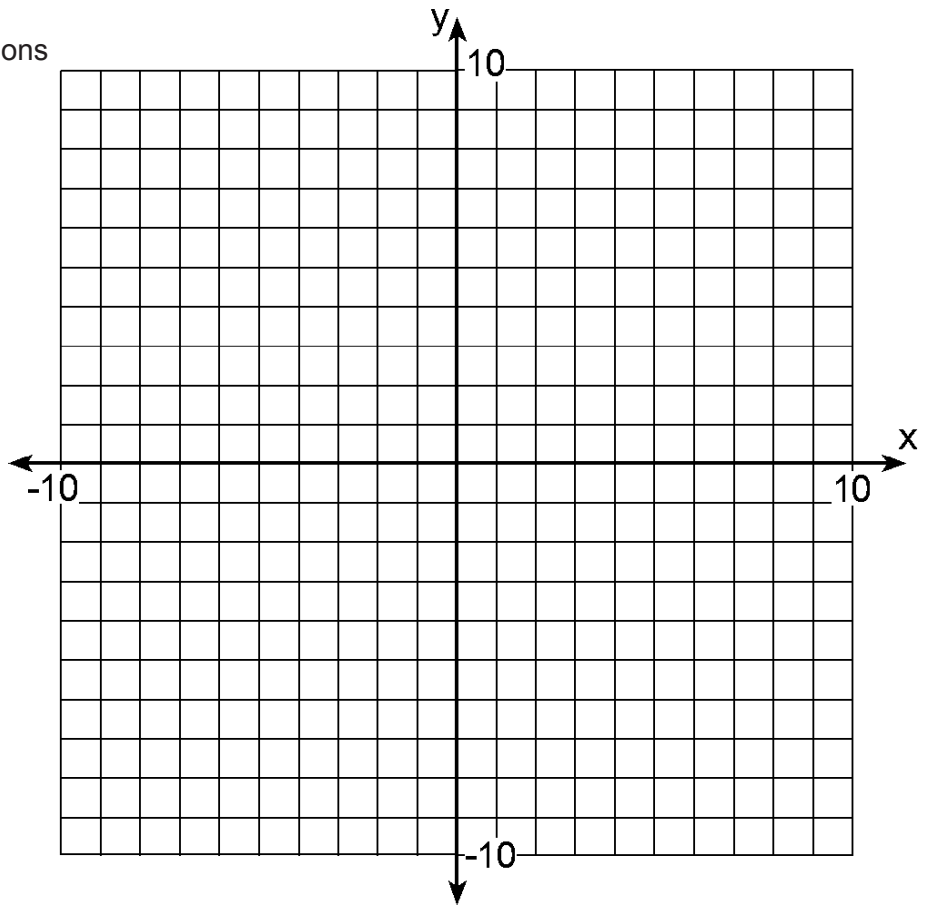
$$y = 2x - 4$$

$$y = -x - 1$$

Part B

What is the solution to the system of equations graphed in Part A?

Show your work:



Answer: _____

- 59** A soccer field is 70 yards shorter than 3 times its width. Its perimeter is 380 yards. Find the length and width of the field.

Show your work:

Answer: _____

60 Solve and check: $48 = \frac{13}{7}x + 9$

61 Is the graph of the following points a function? *Justify your answer.*
 $(-6, 4), (-5, 4), (-4, 3), (-2, 3)$

63 Triangle ABC has coordinates $A(1, 2)$, $B(0, 5)$, and $C(5, 4)$.

Part A

On the graph below, draw and label $\triangle ABC$.

Part B

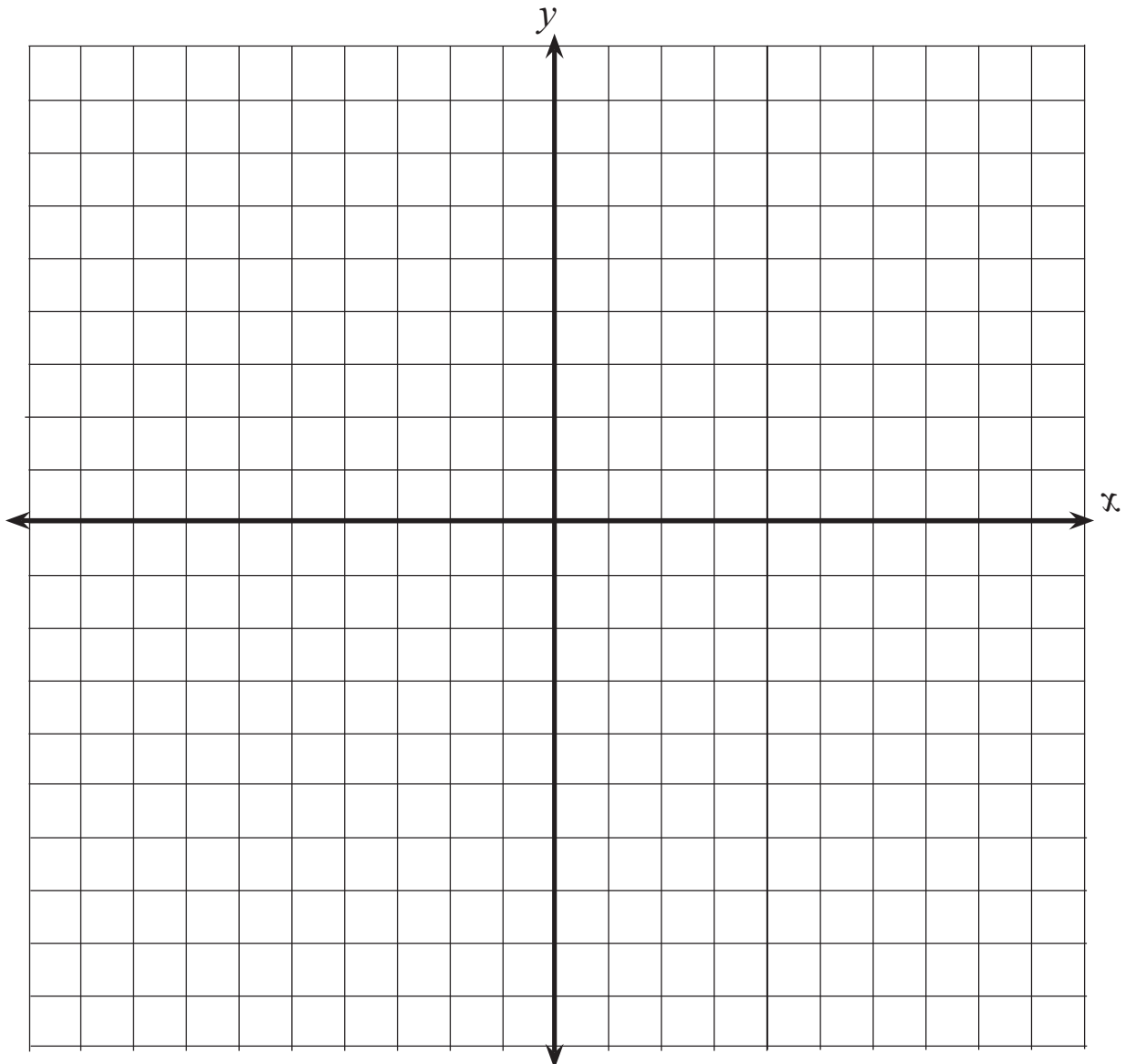
Graph and state the coordinates of $\triangle A'B'C'$, the image of $\triangle ABC$ after the translation which maps (x, y) to $(x - 6, y + 3)$.

Part C

Graph and state the coordinates of $\triangle A''B''C''$ the image of $\triangle A'B'C'$ after a reflection in the x -axis.

Part D

Graph and state the coordinates of $\triangle ABC$, the image of $\triangle A''B''C''$ after a reflection in the origin.

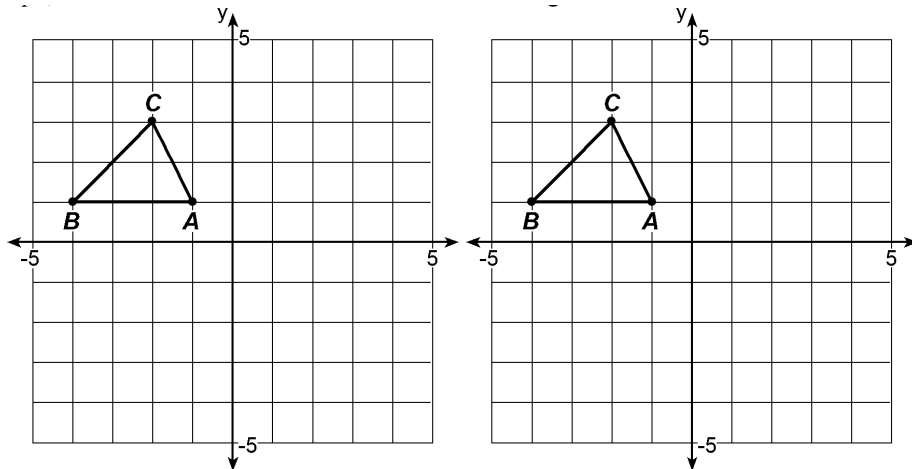


64 Is it possible for a rotation and a dilation to be equivalent?

Part A

Consider a rotation of 180° about the origin and a dilation of -1 centered at the origin.

Each graph below starts with same $\triangle ABC$. On the first graph, rotate $\triangle ABC$ 180° about the origin. On the second graph, dilate $\triangle ABC$ with a SF = -1 centered at the origin.



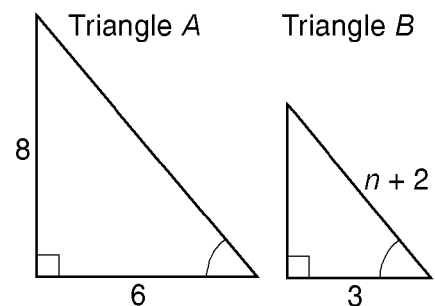
Part B

Are the images formed by the rotation and the dilation of $\triangle ABC$ equivalent? Explain your answer.

Answer: _____

65 In the accompanying diagram, triangle A is similar to triangle B. Find the value of n .

Show your work:



Answer: _____