Released Form

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Grade 8 Mathematics

North Carolina End-of-Grade Assessment

Public Schools of North Carolina
Department of Public Instruction | State Board of Education
Division of Accountability Services/North Carolina Testing Program

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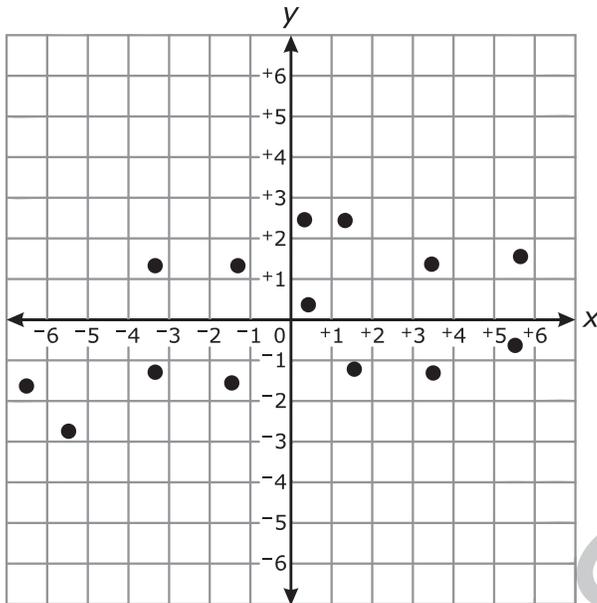Thomas Tomberlin, Senior Director, Office of Educator Preparation and Teacher Licensure, NCDPI
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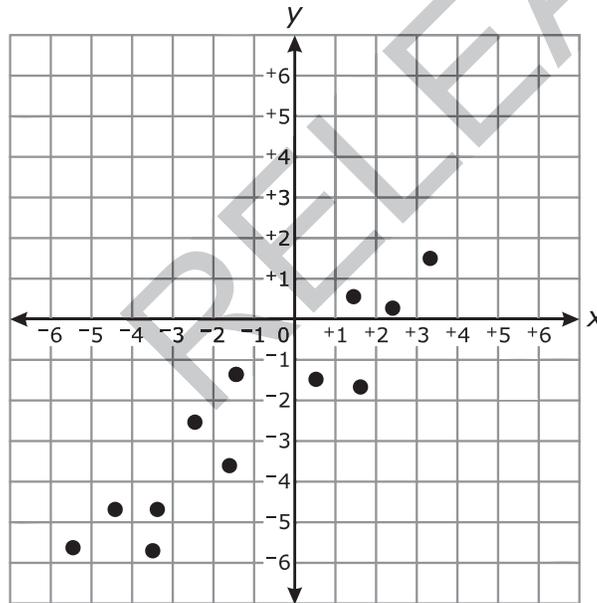
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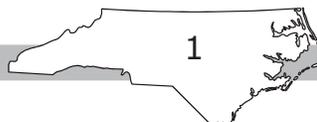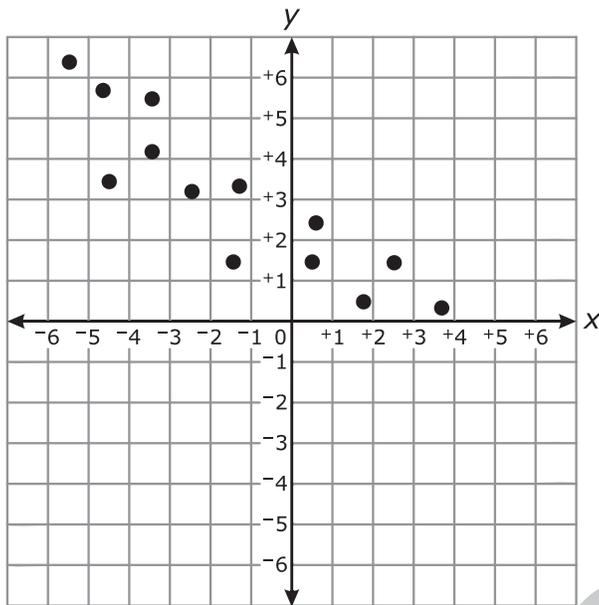1   Which graph shows a negative association?

A

B

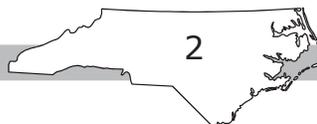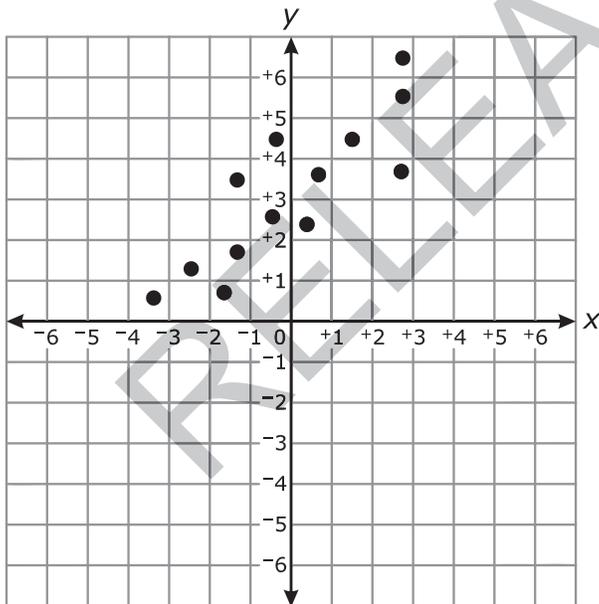**Answer choices C and D are on the following page.**

C

D

2

Go to the next page.

2   In which equation is y a linear function of x?

A $y = x^2$

B $y = 2^x$

C $y = \sqrt{2x} + 8$

D $y = \dfrac{8x + 2}{4}$

3   A charity event raised 4×10^6 dollars for research. This amount was 5 times as much money as the event raised the previous year. How much money did the event raise the previous year?
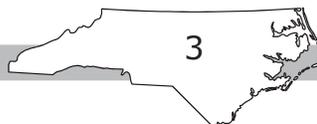
A 8×10^5 dollars

B 2×10^6 dollars

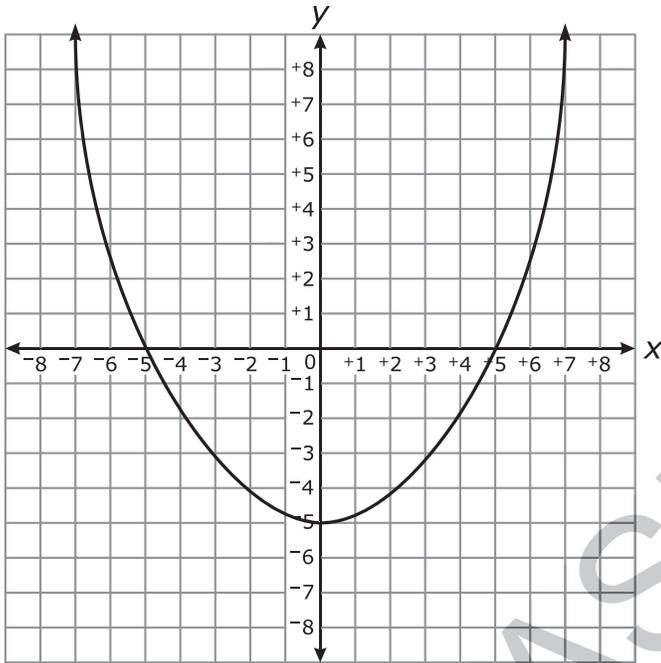C 8×10^6 dollars

D 2×10^7 dollars

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3

Go to the next page.

4   In which graph is *y* **not** a function of *x*?

A
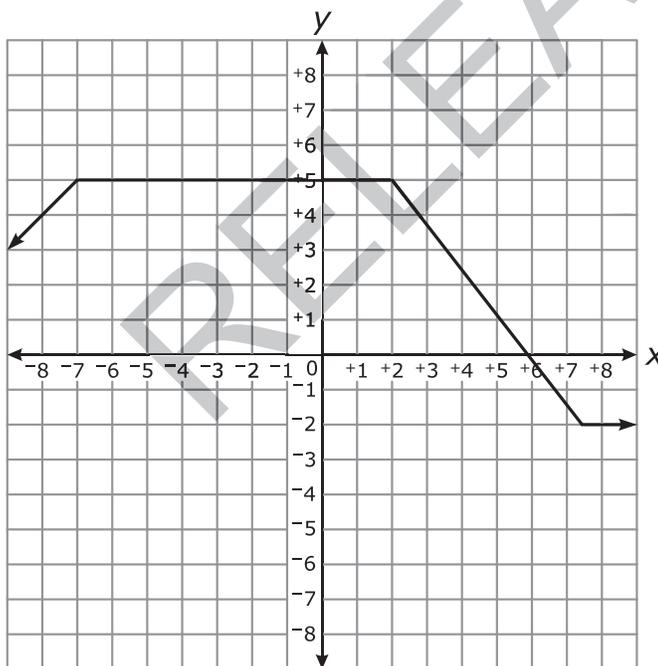

Answer choices B, C, and D are on the following pages.

B

C

Answer choice D is on the following page.

D
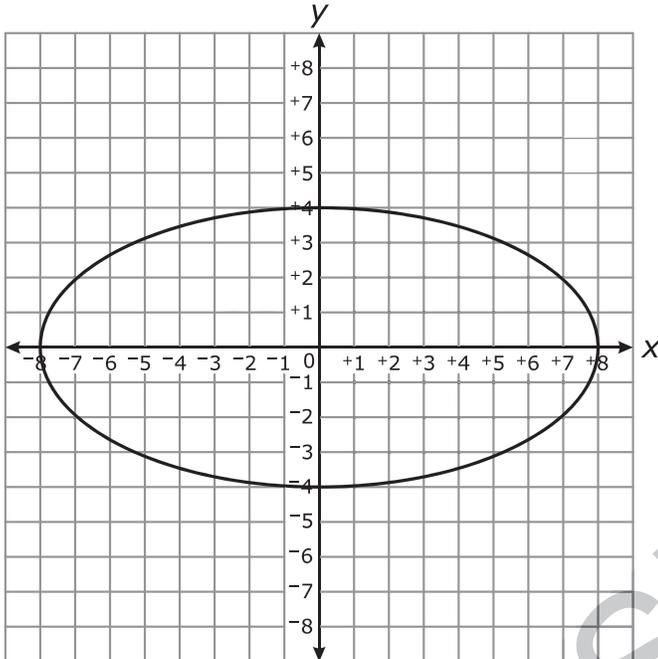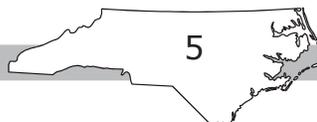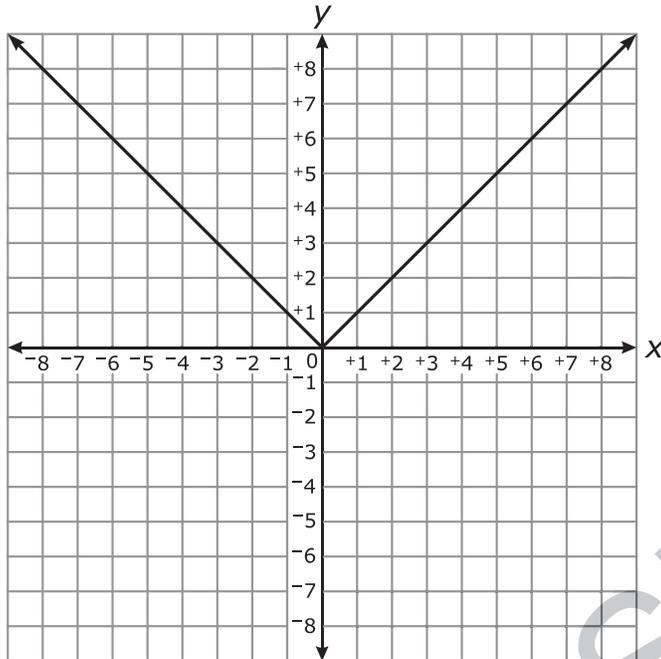
5   Which choice is irrational?

   A $^-8 \div 3$

   B $\frac{1}{3} \bullet \frac{7}{5}$

   C $\sqrt{20}$

   D $-\sqrt{9}$

6   A square has an area of 36 square feet. A second square has an area of 144 square feet. How much greater is the side length of the second square than the side length of the first square?

   A   6 feet

   B   12 feet

   C   54 feet

   D   108 feet

7
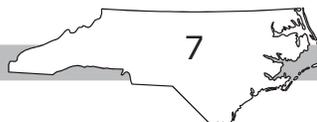
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7   The graph shows triangle *EGH* and triangle *MPT*.
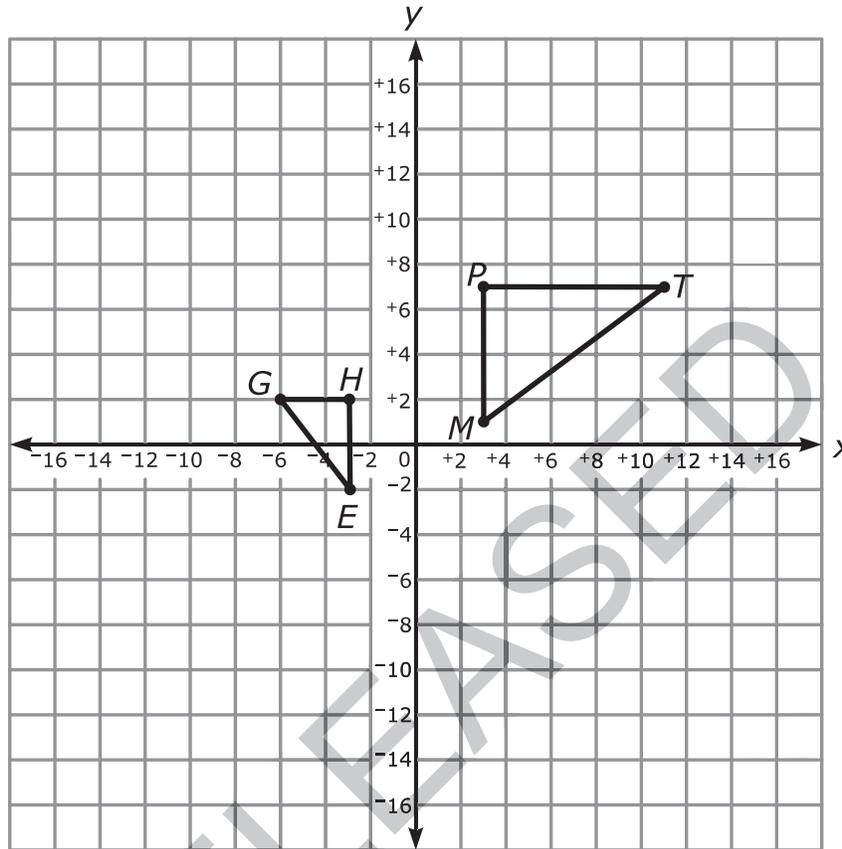
A sequence of three transformations will map triangle *EGH* onto triangle *MPT*. The sequence is described in the table.

First Transformation	???
Second Transformation	dilation with respect to the origin by scale factor 2
Third Transformation	translation 7 units to the right and 13 units up

Question and answer choices A, B, C, and D are on the following page.

8
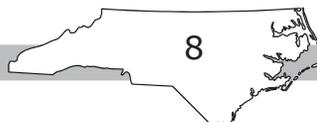
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Which description should replace the question marks (???) in the table to correctly describe the First Transformation?

A   reflection across the *x*-axis

B   reflection across the *y*-axis

C   90° clockwise rotation about the origin

D   90° counterclockwise rotation about the origin

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8   Mr. Jones is a driver's education instructor.

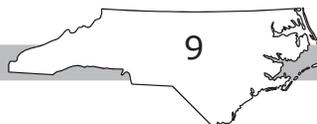- He compared the number of times, x, eight students attended driving practice and their scores, y, on a written driving exam.
- Mr. Jones believes the equation $y = 5x + 60$ models the data well.

What is the meaning of the y-intercept of the model?

A   A student's exam score should increase by about 5 points for each time he or she attends driving practice.

B   A student's exam score should increase by about 60 points for each time he or she attends driving practice.

C   A student should expect to get an exam score of 60 if he or she does not attend driving practice.

D   A student should expect to get an exam score of 5 if he or she does not attend driving practice.
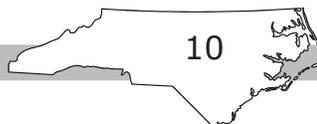
9   In which set of points is *y* a function of *x*?

    A   {($^-$2, 3), (0, 3), ($^-$2, 0), (3, 3)}

    B   {(3, $^-$2), (3, 0), (3, $^-$4), (3, 2)}

    C   {(3, $^-$2), (0, 0), (4, $^-$3), (3, 2)}

    D   {(2, 4), (1, 4), ($^-$2, 4), ($^-$1, 4)}

10   The equation $y = 1{,}500 - 30x$ can be used to estimate the number of cars in a parking lot *x* minutes after the end of a concert. What is the meaning of the slope of the linear model?

    A   About 1,500 cars leave the parking lot every minute after the concert ends.

    B   About 30 cars leave the parking lot every minute after the concert ends.

    C   About 1,500 cars will be in the parking lot when the concert ends.

    D   About 30 cars will be in the parking lot when the concert ends.
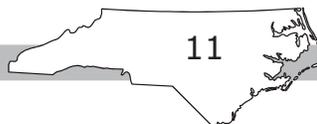
Questions 11 through 15 require you to write your answers in the boxes. Write only one number or symbol in each box.

11   What is the value of $\left(\frac{5}{8}\right)^3 \bullet \left(\frac{16}{25}\right)^2$?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.

12   The table defines *y* as a linear function of *x*.

x	*y*
2	7
6	21
8	28

What is the slope of the linear function?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.

12

Go to the next page.

13 What positive integer is closest to the value of $\sqrt{172}$?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.
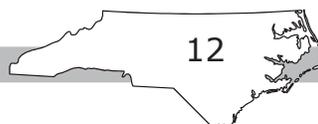
14 What is the value of the expression shown below?

$$\frac{3^2 \bullet 3^5}{3^3}$$

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.
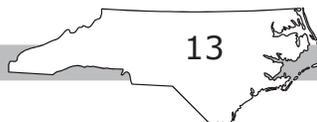
15   A linear function passes through the points shown in the table.
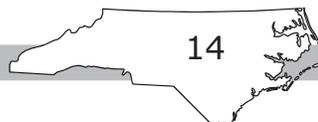
x	y
15	⁻10
12	⁻4
11	⁻2
10	0
7	6

What is the *y*-intercept of the function?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.

14   Go to the next page.

This is the end of the calculator inactive test questions.

Directions:

1. **Look back over your answers for the calculator inactive questions. You will not be able to go back and work on these questions once you are given a calculator.**

2. **Make sure all your answers are entered appropriately in your book.**

3. **Raise your hand to let your teacher know you are ready to begin the calculator active test questions.**

4. **Do not begin work on the calculator active test questions until your teacher has given you a calculator.**

15
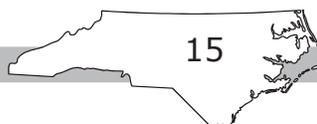
Questions 16 through 20 require you to write your answers in the boxes. Write only one number or symbol in each box.

16 Two expressions are shown. In Expression Two, x is a positive integer.

$$\text{Expression One: } 4 \bullet 10^3$$
$$\text{Expression Two: } x \bullet 10^5$$

The value of Expression Two is 25 times the value of Expression One. What is the value of x?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.
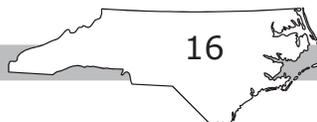
17 What is the value of x in the equation shown below?

$$\frac{1}{2}(2x + 6) = 5x + 15 - 3x$$

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.

16

Go to the next page.

18   The total cost to purchase concert tickets online includes a processing fee. The processing fee is a constant amount that does not depend on the number of tickets ordered. The table shows the total cost to purchase a given number of tickets to the concert.

Number of Tickets	Total Cost
3	$91
5	$145
6	$172

What is the processing fee, in dollars, for each order?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.
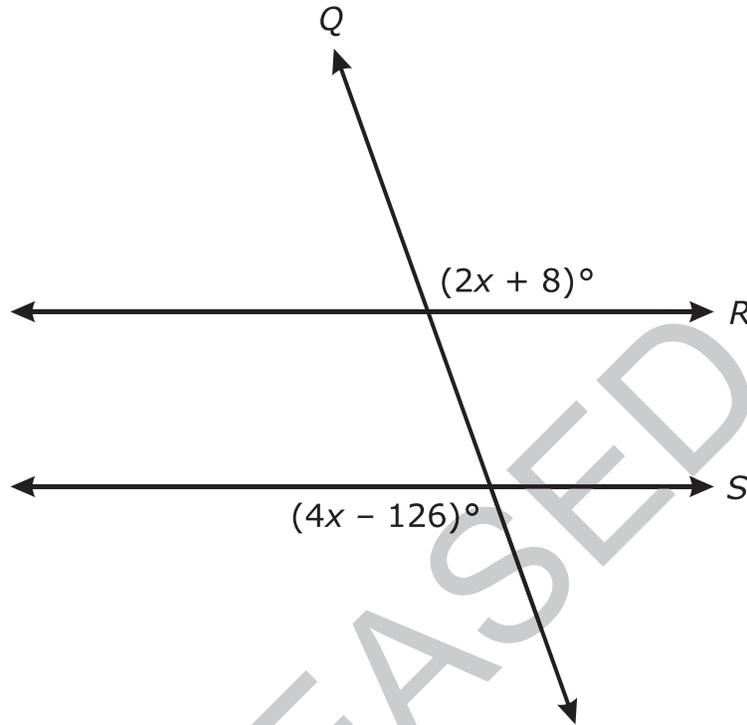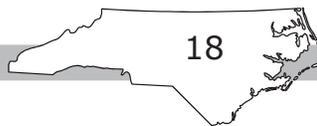
17
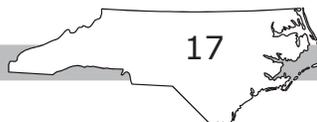
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19   In the diagram, line *R* is parallel to line *S*. The lines are cut by transversal *Q*.

What is the value of *x*?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces are only allowed between whole numbers and fractions.

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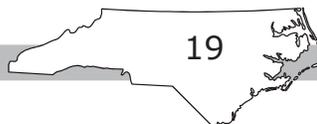20   What is the distance, in units, between (‾4, 6) and (8, 1)?

Only 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., -, and / are allowed in your answer.
Mixed numbers are entered by adding a space after the whole number. Spaces
are only allowed between whole numbers and fractions.

21   Which table represents a linear function with a slope greater than the slope of $y = 6x + 5$?

A

x	y
3	31
6	37

B

x	y
4	42
8	66

C

x	y
6	45
11	80

D

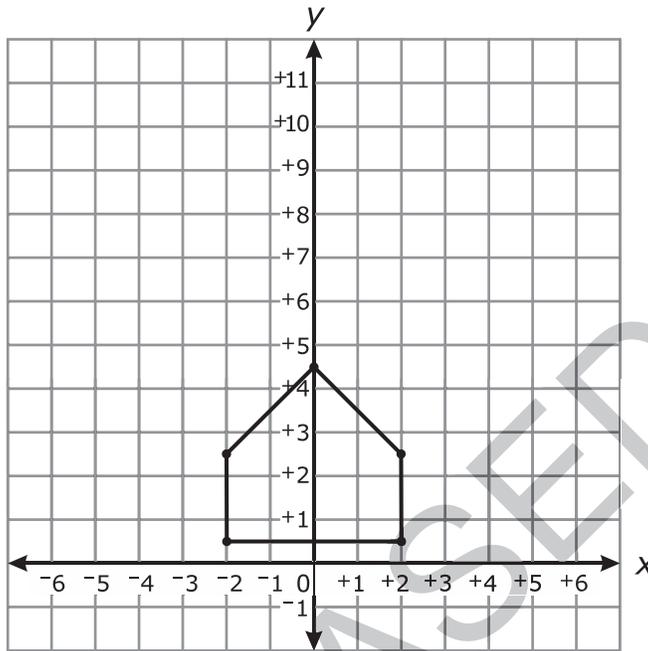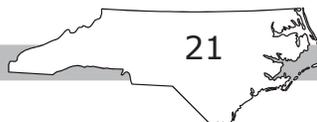| x	y
1	9
5	29
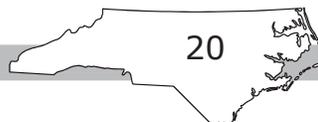
22   A pentagon is shown.

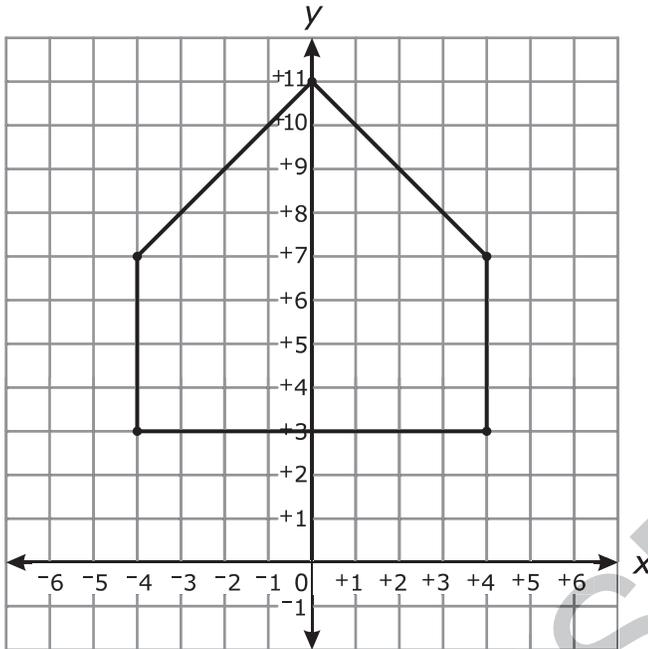Which choice shows the pentagon after it is dilated with respect to the origin by a scale factor of 2?

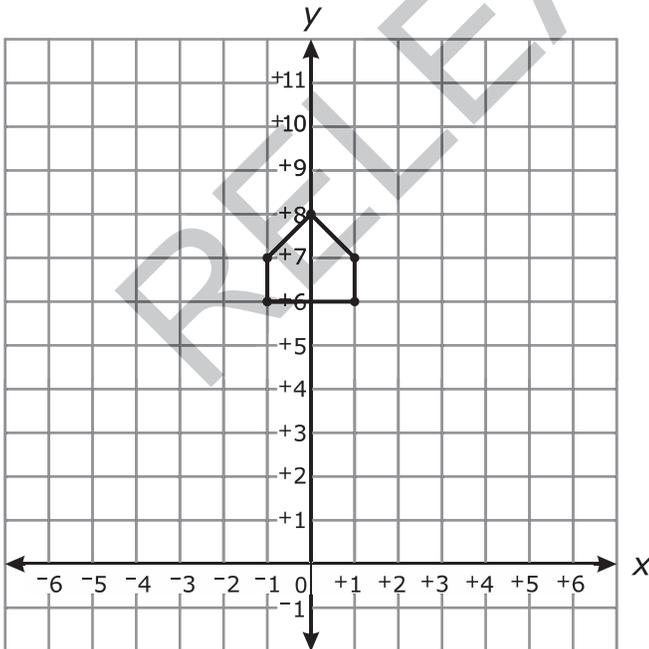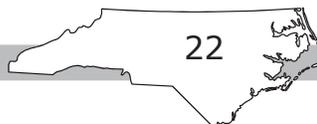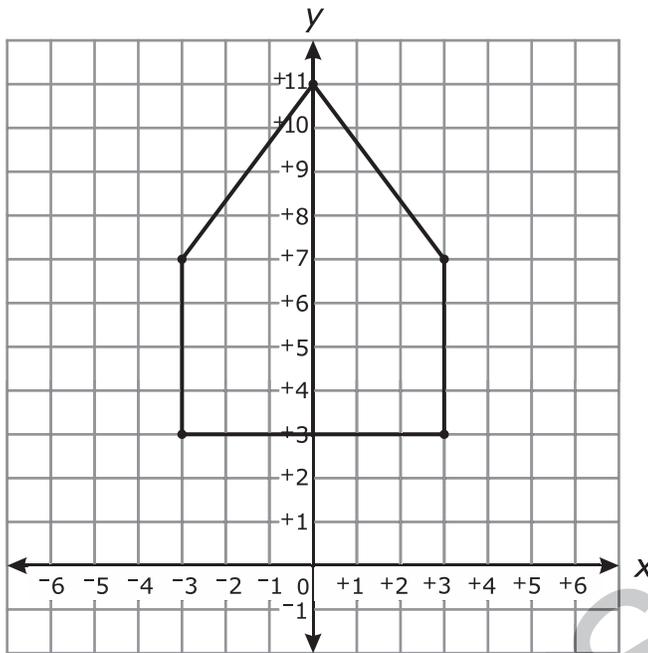**Answer choices A, B, C, and D are on the following pages.**

21

A

B

Answer choices C and D are on the following page.

C

D

Go to the next page.
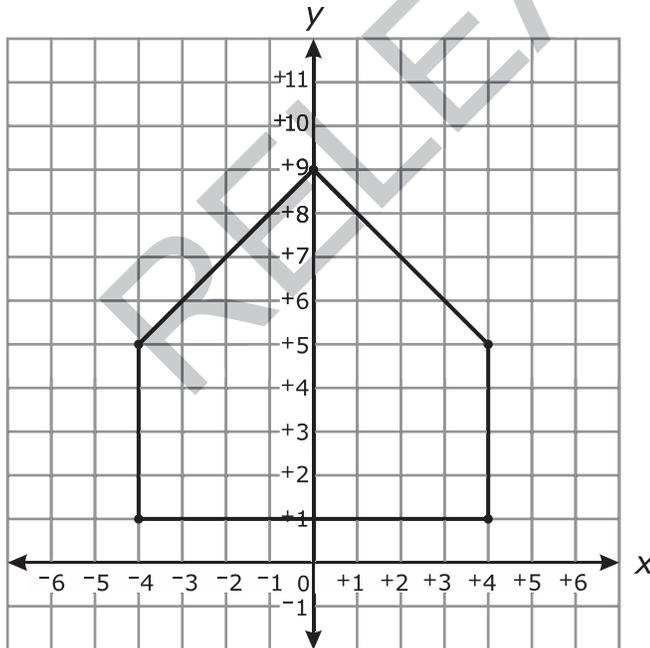
23 The equation $y = 12.50x$ models the cost, in dollars, to purchase x bottles of olive oil from a store. Which table shows a store that sells bottles of olive oil at a lower cost per bottle?

A

Bottles	Total Cost
3	$39.00
7	$91.00

B

Bottles	Total Cost
4	$50.00
9	$112.50

C

Bottles	Total Cost
5	$61.25
8	$98.00

D

Bottles	Total Cost
2	$25.50
6	$76.50
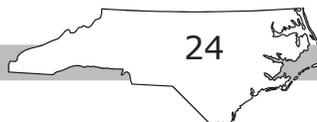
24   What is the ***approximate*** distance between the points (⁻2, 7) and (4, ⁻3)?

    A   4.5 units

    B   5.1 units

    C   11.4 units

    D   11.7 units

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25   A middle school has 250 students. At the school,

- 65 students play football,
- 40 students play basketball, and
- 12 of the students who play basketball also play football.
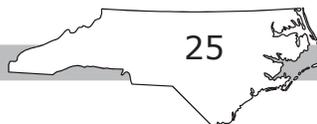
Which two-way table represents this data?

A

	Basketball Players	Non-Basketball Players	Total
Football Players	12	53	65
Non-Football Players	28	157	185
Total	40	210	250

B

	Basketball Players	Non-Basketball Players	Total
Football Players	12	40	52
Non-Football Players	53	12	65
Total	65	62	127
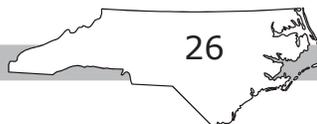
Answer choices C and D are on the following page.

C

	Basketball Players	Non-Basketball Players	Total
Football Players	65	12	77
Non-Football Players	185	28	213
Total	250	40	290

D

	Basketball Players	Non-Basketball Players	Total
Football Players	28	37	65
Non-Football Players	12	28	40
Total	40	210	250
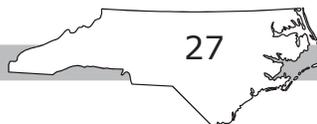
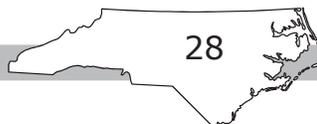26   A city plans to build a concrete path along a diagonal of a rectangular park.

- The park's dimensions are 200 yards wide by 320 yards long.
- The path will be 1 yard wide.
- It will cost the city $10.75 per square yard to build this path.

Which estimate is closest to the cost of the path?

A $5,590

B $4,060

C $3,770

D $2,720

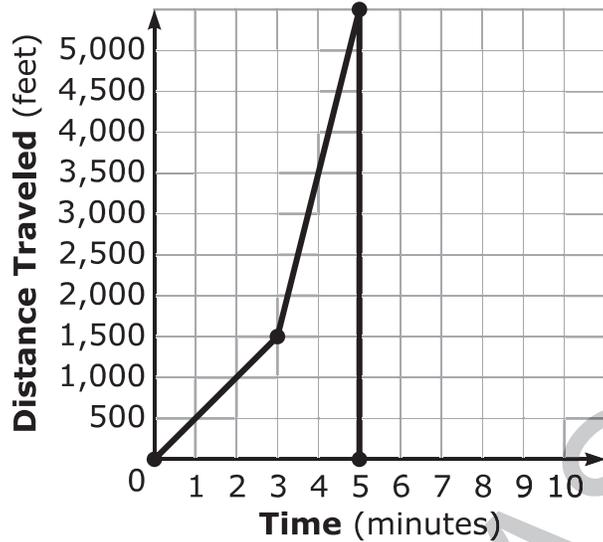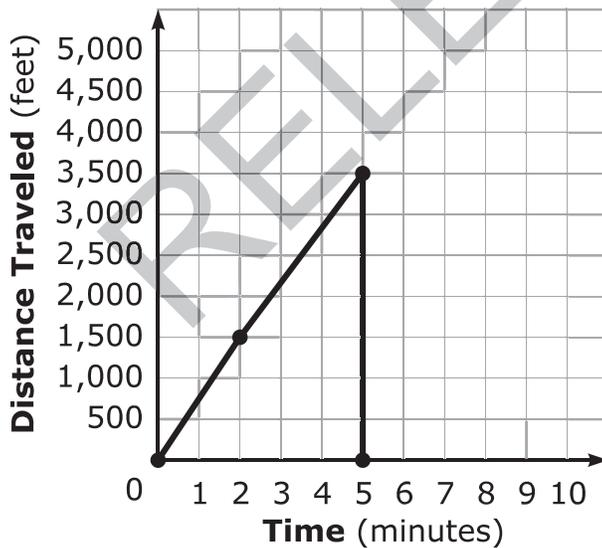RELEASED

27   Alex was riding his bike at a constant speed. He saw a friend ahead of him and
      sped up to reach him. Alex and his friend stopped to talk once Alex reached him.
      Which graph *best* shows Alex's bike ride?

A

B

Answer choices C and D are on the following page.

29
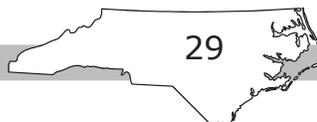
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C

D
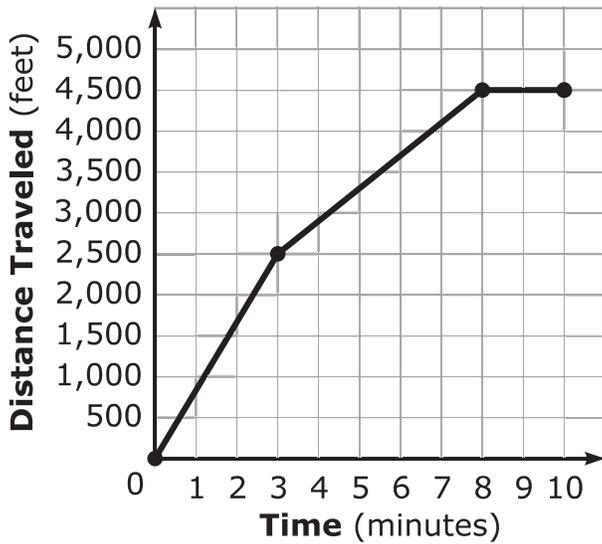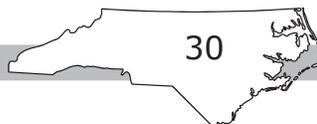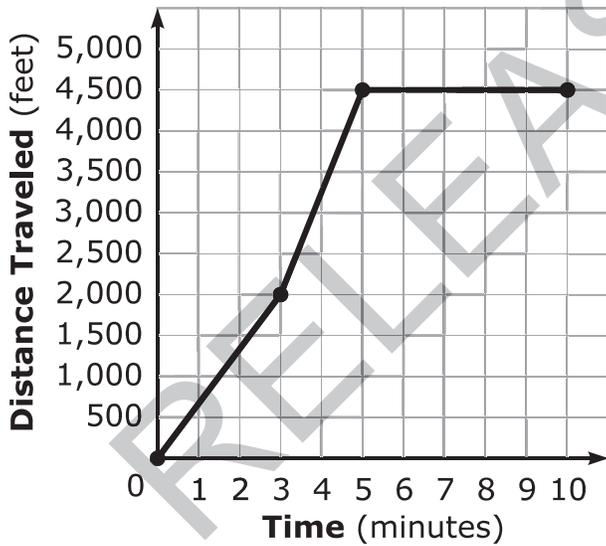
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28   Two companies sell shirts.

- The first company charges $18 per shirt plus an additional $12 for shipping.
- The second company charges $20 per shirt plus an additional $4 for shipping.

How many shirts are in an order that would cost the same from both companies?

A   3

B   4

C   5

D   6

31

Go to the next page.

29   In which table is *y* a function of *x*?

A

x	*y*
5	6
4	6
3	6
2	6

B

x	*y*
2	4
3	3
4	2
4	1

C

x	*y*
5	6
5	0
1	0
1	6
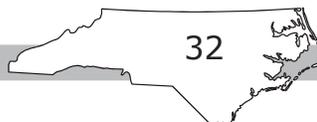
Answer choice D is on the following page.

D

x	y
3	7
3	6
1	3
7	1

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33
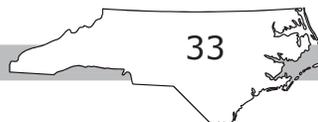
Go to the next page.

30   A tower stands 140 feet tall on level ground. A supporting wire is attached to the ground 72 feet away from the base of the tower. The wire stretches from the ground to the top of the tower. To the nearest foot, how long is the supporting wire?

   A   120 feet

   B   157 feet

   C   182 feet

   D   212 feet

31   Which choice is a function that has a slope that is two times the slope of the linear function shown in the table below?

x	y
2	5
3	8
4	11
5	14

   A $y = 3x - 2$

   B $y = \frac{2}{3}x - 1$

   C $y = 1 - \frac{2}{3}x$

   D $y = 6x - 4$

34
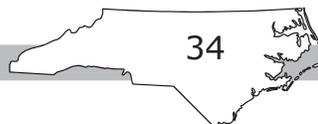
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32 A cone has a radius of 5 cm and a height of 12 cm. What is the *approximate* volume of the cone?

    A $314\ cm^3$

    B $754\ cm^3$

    C $942\ cm^3$

    D $2{,}261\ cm^3$

RELEASED
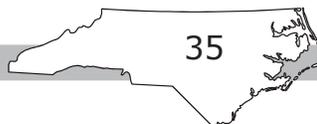
33   Which graph shows a positive association?

A

Answer choices B, C, and D are on the following pages.
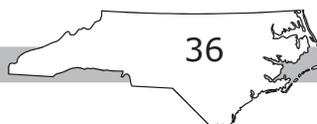
Go to the next page.

B

C

Answer choice D is on the following page.

37
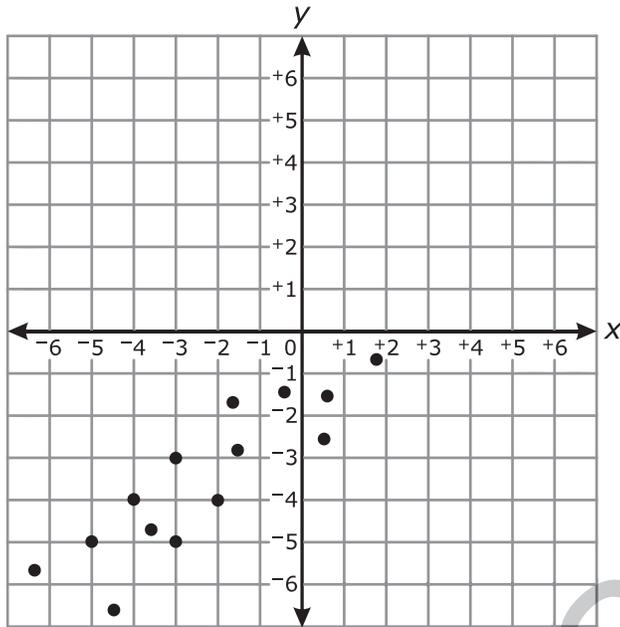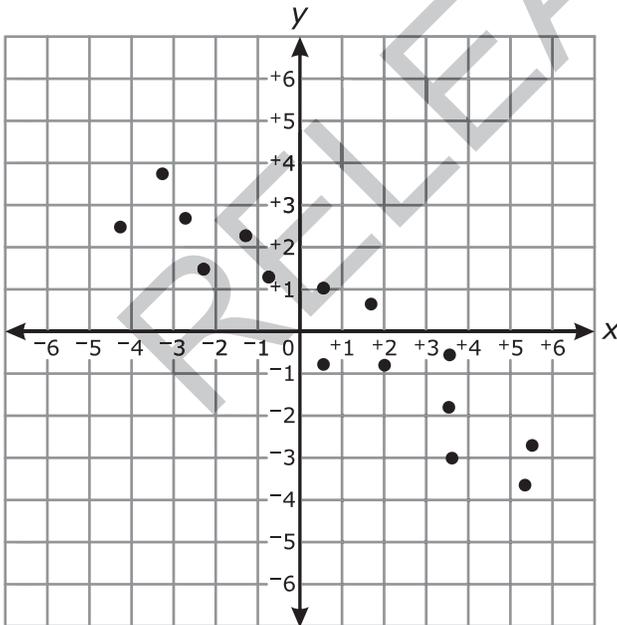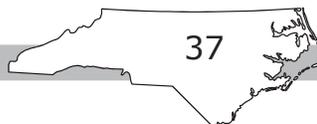
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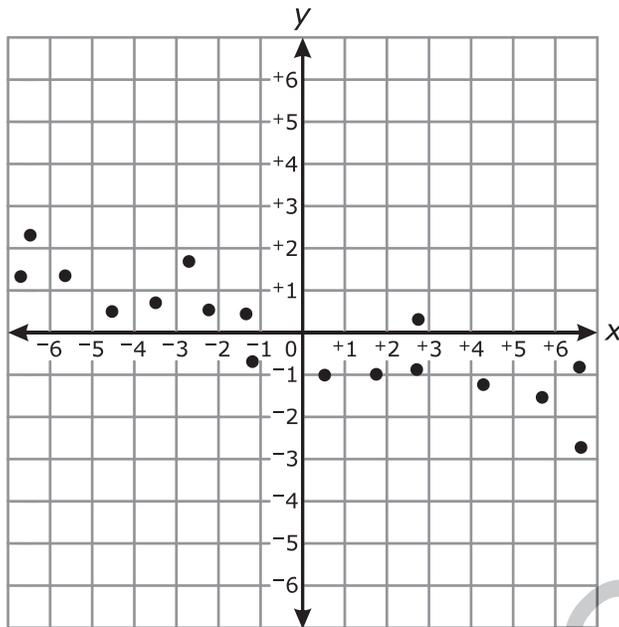
D
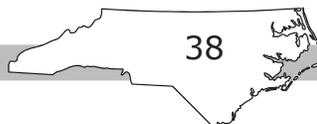
Go to the next page.

34   In which choice is y a linear function of x?

    A $y = 3x + 5$

    B $y = 5x^2 + 3$

    C $y = 5\sqrt{x}$

    D $y = \dfrac{3}{x}$
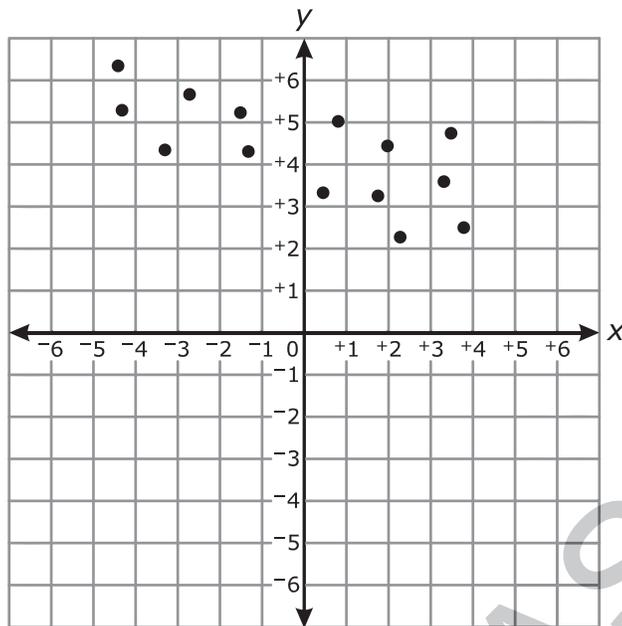
35   A cylinder has a diameter of 5 centimeters and a height of 7.5 centimeters. What is the ***approximate*** volume of the cylinder?

    A   38 cubic centimeters

    B   118 cubic centimeters

    C   147 cubic centimeters

    D   589 cubic centimeters
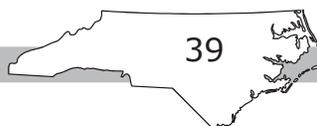
36   Ms. Philips compared the cost of two online book clubs.

- The first book club charges a $20 membership fee plus an additional $12 for each book purchased.

- The second book club charges a $35 membership fee plus an additional $9 for each book purchased.

How many books would a customer need to purchase from either company for the cost to be the same for both book clubs?

A   5

B   21

C   55

D   80
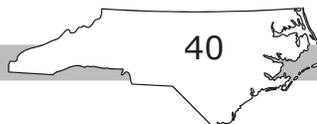
37   Which choice **best** models the data in the scatterplot shown below?
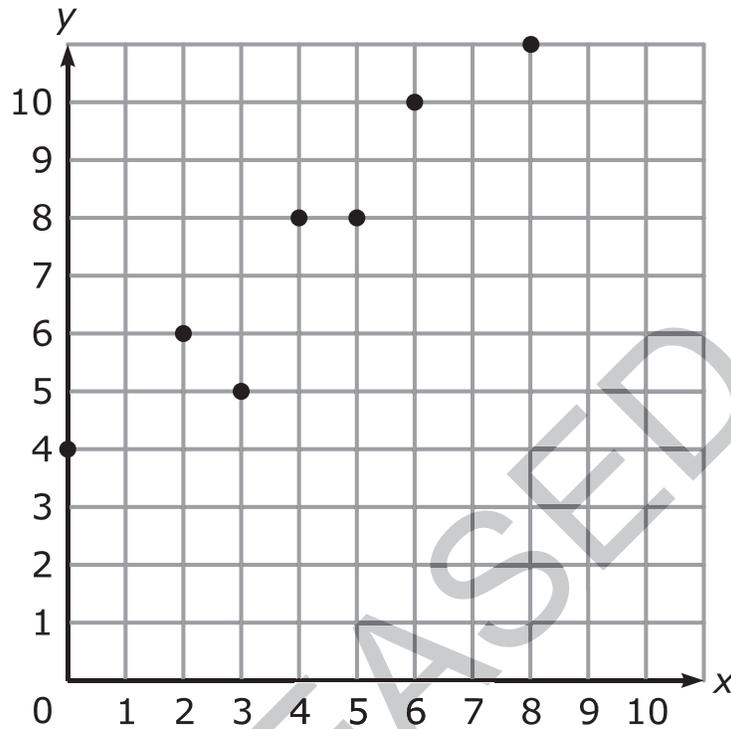
A $y = x - 4$

B $y = x + 4$

C $y = 2x - 4$

D $y = 2x + 4$
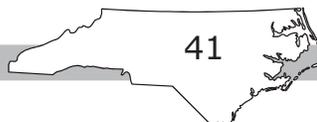
38   There are 13 students in Ms. Holcombe's class. She made a scatterplot to show the numbers of absences and the semester grades.
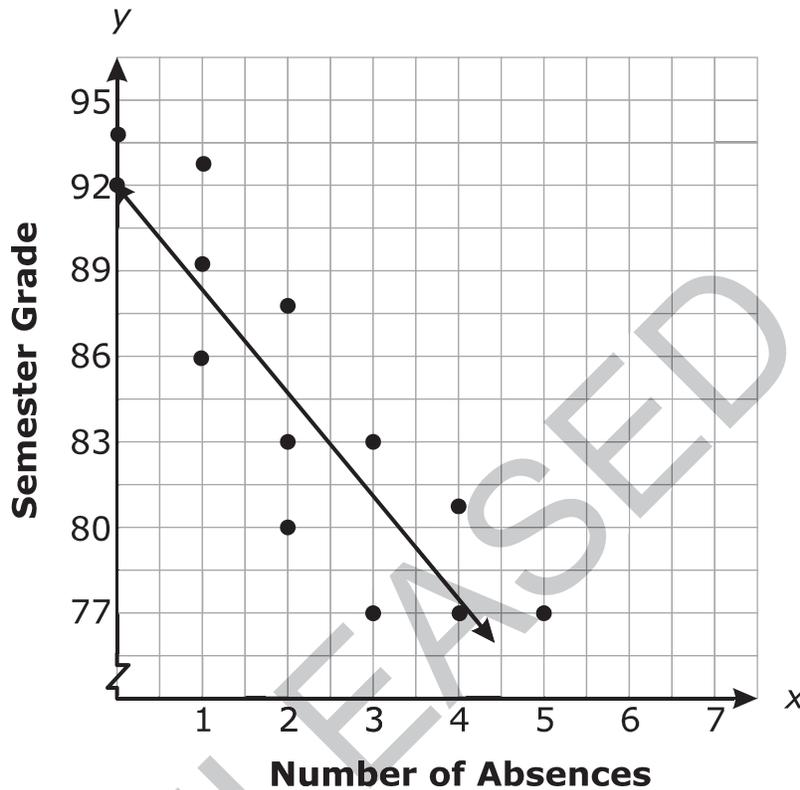
Ms. Holcombe determined that $y = {}^-3.6x + 92$ is a good model for the data. What is the meaning of the slope of the model?

A   The class averaged a 92 for the semester.

B   The highest grade for the semester was a 92.

C   On average, for every one absence, a student's grade went down by 3.6 points.

D   On average, for every 3.6 absences, a student's grade went down by 1 point.
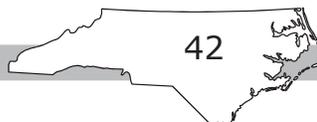
39   Jessica leaned a 15-foot ladder against a building so that the bottom of the ladder was located 5 feet from the base of the building, along level ground. To the nearest foot, how high did the ladder reach up the building?

   A   14 feet

   B   15 feet

   C   16 feet

   D   20 feet
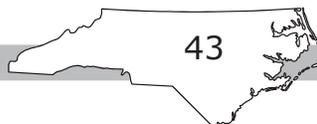
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40   Which table represents a linear function that has the same *y*-intercept as *y* = 5*x* − 3?

A

x	y
⁻3	⁻8
⁻2	⁻7
⁻1	⁻6

B

x	y
⁻3	⁻9
⁻2	⁻7
⁻1	⁻5

C

x	y
0	⁻1
1	4
2	9

D

x	y
0	0
1	⁻3
2	⁻6

44

Go to the next page.

41   What is the measure of angle *z* in the diagram below?

$(4x + 15)°$

$(2x + 6)°$ z $(8x - 9)°$
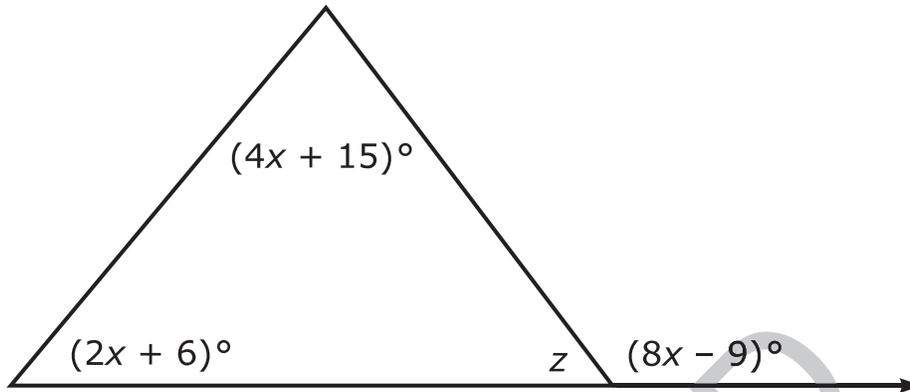
A   15°

B   36°

C   69°

D   75°

42   In the equation shown, k is a constant.

$$3x + 6(2x + 5) = k(3x + 4)$$

What is the value of k if the equation has no solutions?

A   3

B   5

C   6

D   15

45

Go to the next page.

43   Triangle *PQR* is shown in the graph.
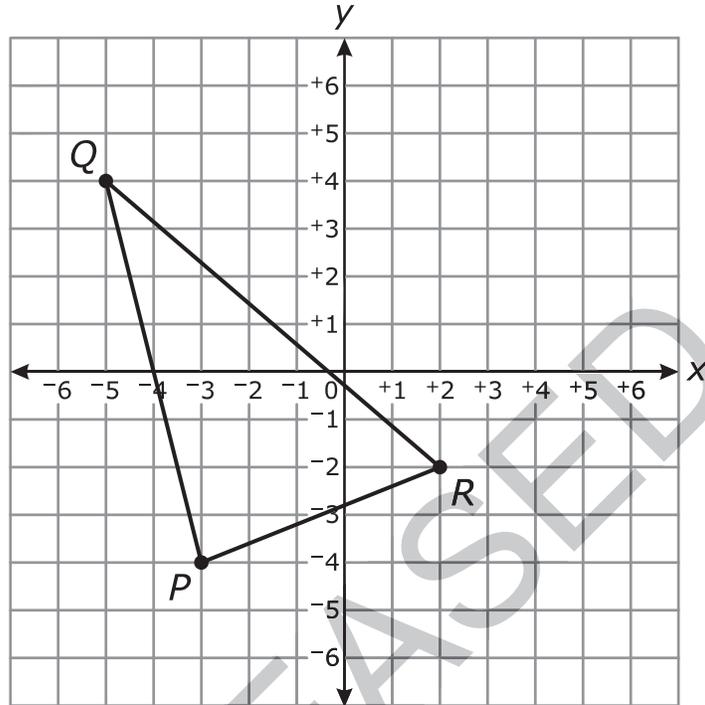
The triangle will be reflected over the *y*-axis and then translated 2 units to the right, resulting in triangle *P'Q'R'*. What will be the coordinates of *P'*?

A   (⁻5, 4)

B   (⁻1, 4)

C   (1, ⁻4)

D   (5, ⁻4)
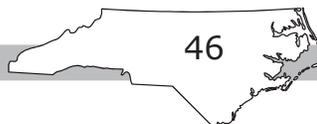
44   A television provider has a movie plan that charges a $10 sign-up fee plus
       $2.00 per movie watched. A second provider has a similar plan that charges
       an $8 sign-up fee plus $3.00 per movie watched. How many movies would
       a customer have to watch from either television provider to be charged the
       same amount by both providers?

       A   2

       B   8

       C   10

       D   14

45   Which function has the same rate of change as the line that passes through
       the points (3, 1) and (8, 7)?

       A $y = \frac{1}{4}x - 6$

       B $y = \frac{5}{6}x + \frac{5}{13}$

       C $y = \frac{6}{5}x + 2$

       D $y = 4x - \frac{13}{5}$

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Go to the next page.

This is the end of the Mathematics test.

Directions:

1. **Look back over your answers for the calculator active questions only.**

2. **Make sure all your answers are entered appropriately in your book.**

3. **Put all of your papers inside your test book and close your test book.**

4. **Place your calculator on top of the test book.**

5. **Stay quietly in your seat until your teacher tells you that testing is finished.**

6. **Remember, teachers are not allowed to discuss questions from the test with you, and you are not allowed to discuss with others any of the test questions or information contained within the test.**

48
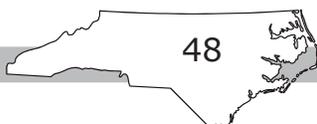
Grade 8
Mathematics
RELEASED Form
2026
Answer Key

Calculator Inactive

Item Number	Type	Key	DOK*	Standard
1	MC	C	1	8.SP.1
2	MC	D	1	8.F.3
3	MC	A	2	8.EE.3
4	MC	B	1	8.F.1
5	MC	C	1	8.NS.1
6	MC	A	2	8.EE.2
7	MC	D	3	8.G.3
8	MC	C	2	8.SP.3
9	MC	D	2	8.F.1
10	MC	B	2	8.SP.3
11	GR	0.1	3	8.EE.1
12	GR	3.5	1	8.F.4
13	GR	13	1	8.NS.2
14	GR	81	1	8.EE.1
15	GR	20	1	8.F.4

GRADE 8 MATHEMATICS RELEASED FORM

Calculator Active

Item Number	Type	Key	DOK*	Standard
16	GR	1	3	8.EE.3
17	GR	-12	1	8.EE.7
18	GR	10	2	8.F.4
19	GR	67	2	8.G.5
20	GR	13	1	8.G.8
21	MC	C	2	8.F.2
22	MC	D	2	8.G.3
23	MC	C	2	8.F.2
24	MC	D	1	8.G.8
25	MC	A	2	8.SP.4
26	MC	B	2	8.G.7
27	MC	D	2	8.F.5
28	MC	B	2	8.EE.8
29	MC	A	2	8.F.1
30	MC	B	2	8.G.7
31	MC	D	2	8.F.2
32	MC	A	1	8.G.9
33	MC	B	1	8.SP.1
34	MC	A	2	8.F.3
35	MC	C	1	8.G.9
36	MC	A	2	8.EE.8
37	MC	B	2	8.SP.2
38	MC	C	2	8.SP.3
39	MC	A	2	8.G.7

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Go to the next page.

Item Number	Type	Key	DOK*	Standard
40	MC	B	2	8.F.2
41	MC	C	2	8.G.5
42	MC	B	3	8.EE.7
43	MC	D	2	8.G.3
44	MC	A	2	8.EE.8
45	MC	C	2	8.F.2

*DOK:
1 = Recall
2 = Skill/Concept
3 = Strategic Thinking