Name _____

Answer items 29 through 55. You may use a calculator.

29 Which equation models a function?

A $x^2 + y^2 = 16$

B $y = \pm\sqrt{x + 16}$

C $y = x^2 + 2x + 16$

D $y = \pm\sqrt{x^2 + 6x + 25}$

30 Kendall transformed the equation $\frac{1}{3}(5x - 15 + 4x) = 1 + 3x + 4$ into a simpler form as shown.

$$\frac{1}{3}(5x - 15 + 4x) = 1 + 3x + 4$$

$$\frac{1}{3}(9x - 15) = 3x + 5$$

$$3x - 5 = 3x + 5$$

$$3x - 3x = -5 + 5$$

$$0 = 0$$

Which statement is correct?

A Kendall made a mistake; the equation has no solution.

B Kendall did everything correctly; the equation has no solution.

C Kendall made a mistake; the equation has an infinite number of solutions.

D Kendall did everything correctly; the equation has an infinite number of solutions.

**31** In the graph below, the two triangles are similar.
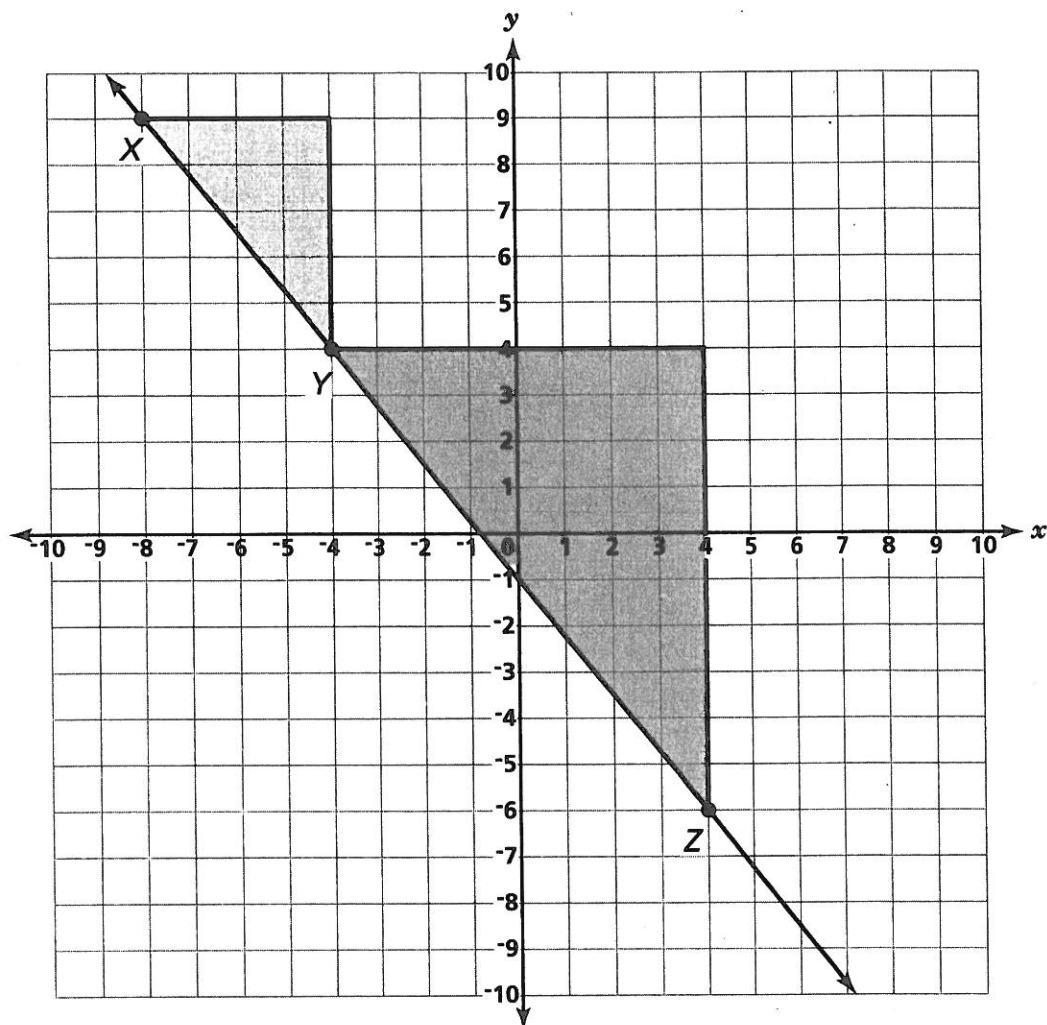
What conclusion can be drawn to determine the slope of line *XZ*?

A   The slope of line *XZ* is $\frac{-10}{4}$, because this is the sum of the slopes of $\overline{XY}$ and $\overline{YZ}$.

B   The slope of line *XZ* is $\frac{-5}{4}$, because this is half the slope of $\overline{YZ}$, which is $\frac{-10}{8}$.

C   The slope of line *XZ* is $\frac{-10}{4}$, because this is twice the slope of $\overline{XY}$, which is $\frac{-5}{4}$.

D   The slope of line *XZ* is $\frac{-5}{4}$, because the slopes of $\overline{XY}$ and $\overline{YZ}$ are each $\frac{-5}{4}$.
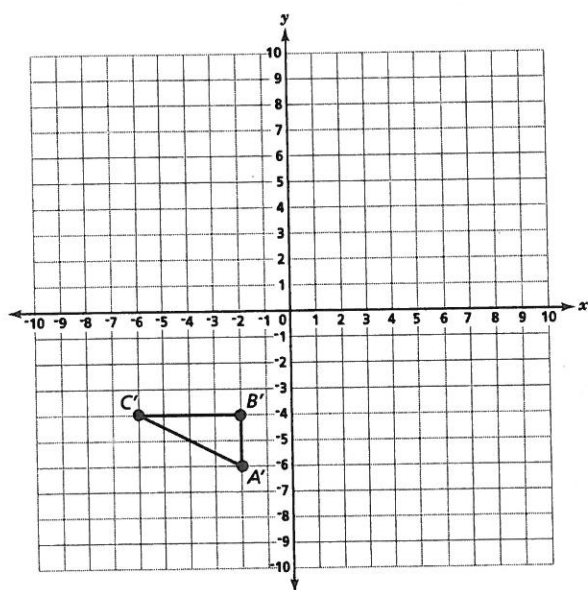
Go On

32 Triangle *ABC* has coordinates *A*(⁻2, 6), *B*(⁻2, 4) and *C*(⁻6, 4). Which coordinate grid shows △*ABC* reflected over the *y*-axis?
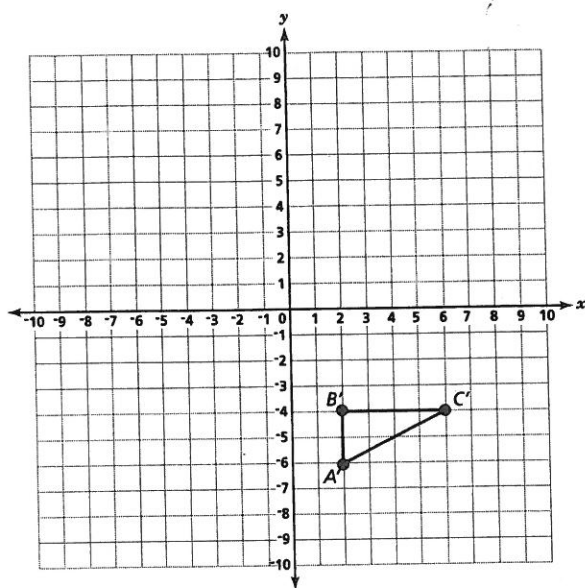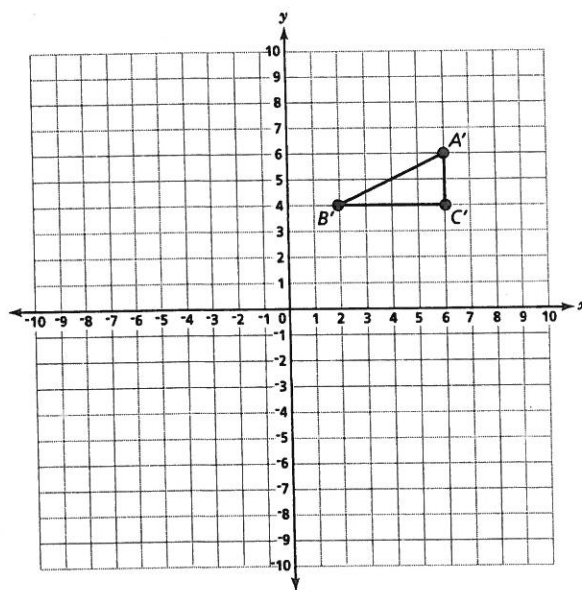

A
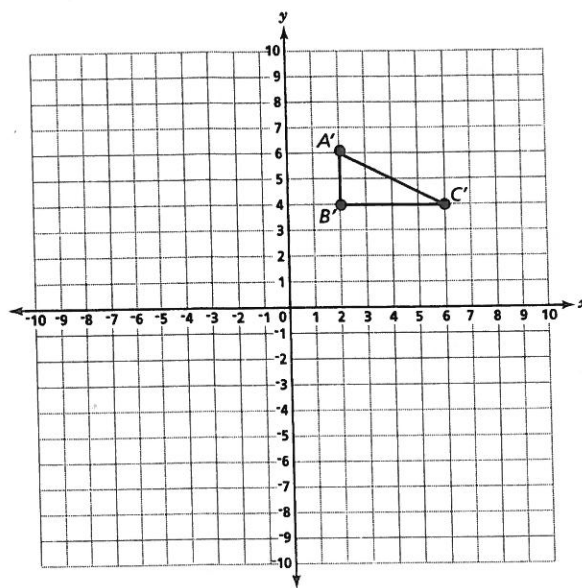
C

B

D

33 A teacher asked four students to estimate the length of a grain of rice. Jack answered 4.5×10^{-3} kilometers, Lilly answered 4.5×10^{-3} meters, Diego answered 4.5×10^{-3} centimeters, and Willa answered 4.5×10^{-3} millimeters.

Who gave the **best** answer?

A Jack

B Lilly

C Diego

D Willa

34 Which table represents a function?

x	y
-1	1
0	3
1	5
2	7

A

x	y
2	0
5	-1
5	1
14	-2

B

x	y
-3	0
0	3
0	-3
3	0

C

| x	y
-3	5
-3	4
-3	0
-3	4

D

35 The height of a falling object can be modeled by the equation $h = -16t^2 + v_0 t + h_0$ where v_0 is the initial velocity in feet per second, t is time in seconds, and h_0 is the initial height in feet. Is the function linear or nonlinear, and why?

A It is linear, because the object falls in a straight line.

B It is linear, because the object falls at a constant speed.

C It is nonlinear, because the object does not fall in a straight line.

D It is nonlinear, because the object does not fall at a constant speed.

Go On

36 Benjamin and Layla each deposited a set amount of money into their savings accounts each month. The graph below shows the total amount Benjamin has in his account after making his deposit each month.

AMOUNT SAVED BY BENJAMIN
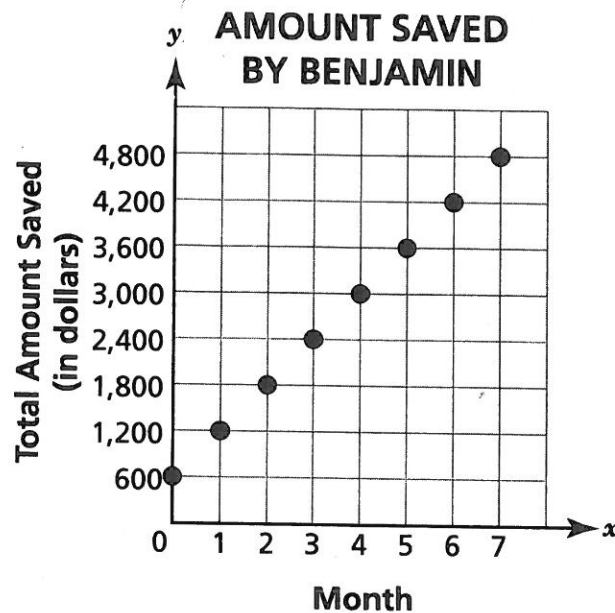
The table below represents the total amount Layla has in her account after making her deposit each month.

Month	Amount Saved
1	$1,400
2	$1,800
3	$2,200
4	$2,600

Using y as the number of dollars saved and m as the number of months where m is a positive integer, which equation models the account that is growing at the faster rate?
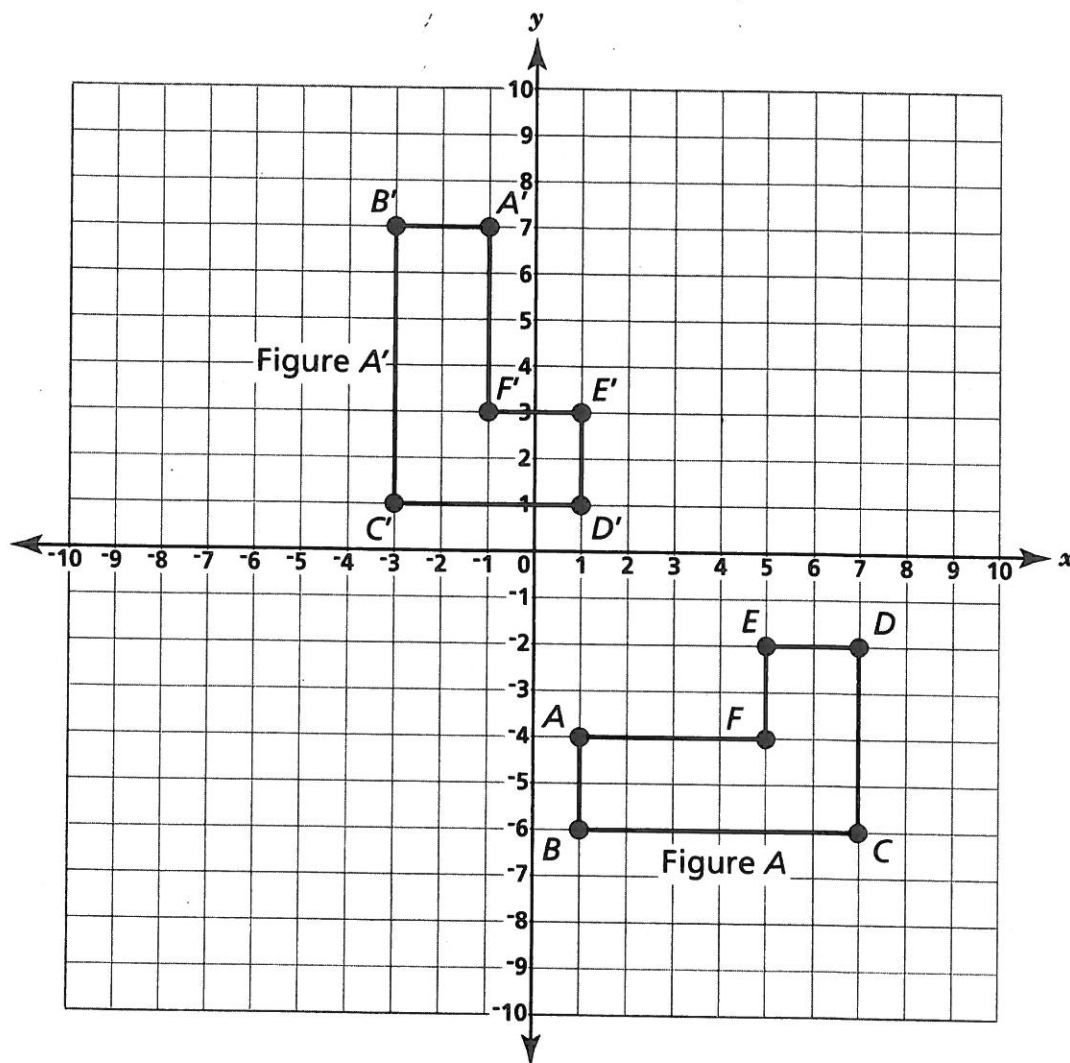
A $y = 600 + 400m$

B $y = 600 + 600m$

C $y = 1,000 + 400m$

D $y = 1,400 + 400m$

37 Where do the graphs of the linear equations $2x + 3y = 4$ and $5x + 6y = 7$ intersect?

A $(-1, 2)$

B $(4, 7)$

C The lines do not intersect.

D The lines are the same line, so they intersect at every point on the line.

Go On

38 Which sequence of transformations on Figure A will result in the similar image Figure A', as shown in the coordinate plane below?

A Translate Figure A 8 units to the right and 3 units up, and then rotate the figure 90° counterclockwise about the origin.

B Translate Figure A 8 units to the left and 3 units up, and then rotate the figure 90° counterclockwise about the origin.

C Translate Figure A 8 units to the right and 3 units up, and then rotate the figure 270° counterclockwise about the origin.

D Translate Figure A 8 units to the left and 3 units up, and then rotate the figure 270° counterclockwise about the origin.

39 Mr. Richards gave the table shown below to four of his students and asked them to determine the y-intercept of the function.

x	y
−4	0
−2	−1
4	−4

Luis answered −8, Natasha answered −6, Grayson answered −2, and Kaylee answered −1. Which student answered *correctly*?

A   Luis

B   Natasha

C   Grayson

D   Kaylee

40 Fifty students were surveyed and asked if they played sports and if they had a job. The table below summarizes their responses.

	Job	No job
Plays sports	20	5
Does not play sports	15	10

Of the students who play sports, what percent *do not* have a job?
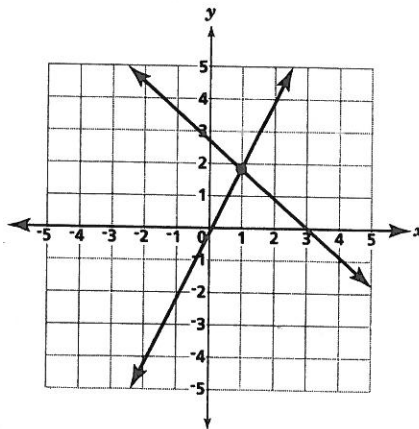
A   5%

B   15%

C   20%

D   25%

Go On

41 The ordered pairs shown in the table represent a function.

x	y
−3	−4
a	4
4	10
9	b

Which values for a and b would result in the function being linear?

A $a = {}^-1; b = 20$

B $a = {}^-1; b = 22$

C $a = 1; b = 20$

D $a = 1; b = 22$

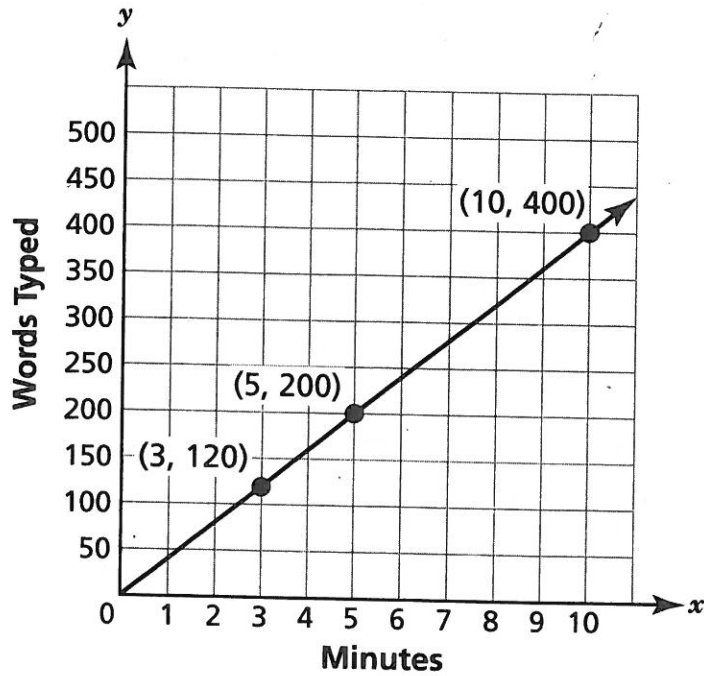**42** A system of linear equations is shown in the graph below.

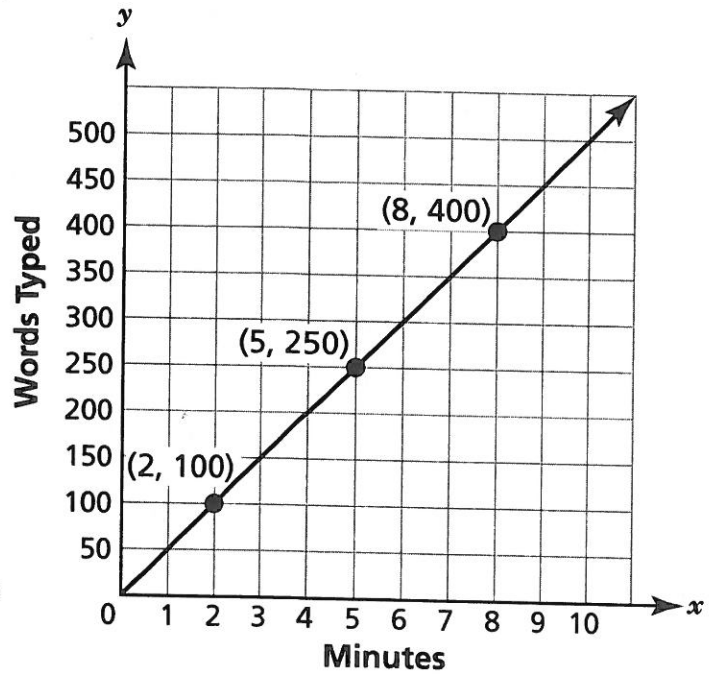Which point *best* estimates the solution to the system of equations?
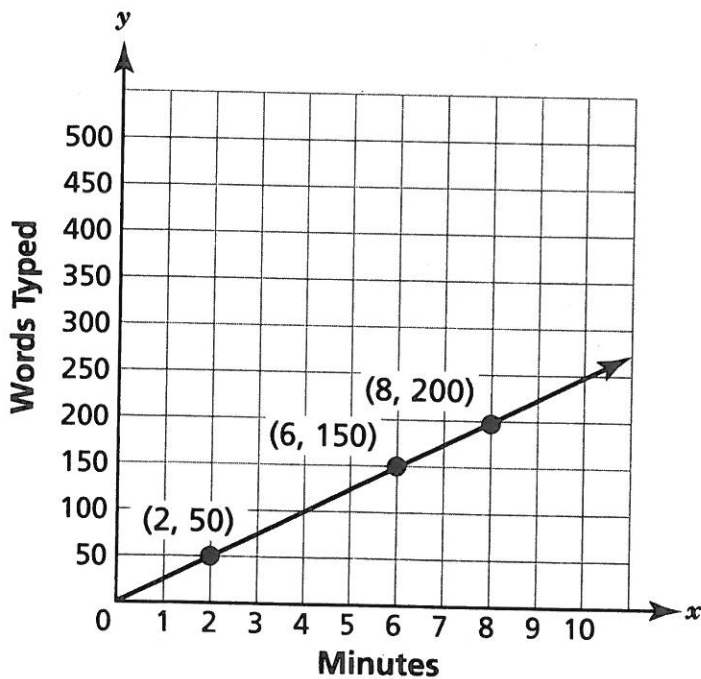
A   (2, 1)

B   (1, 2)

C   (0, 0)

D   (2, 2)

43 Ingrid types faster than 50 words per minute. Which graph represents the number of words Ingrid can type over time?
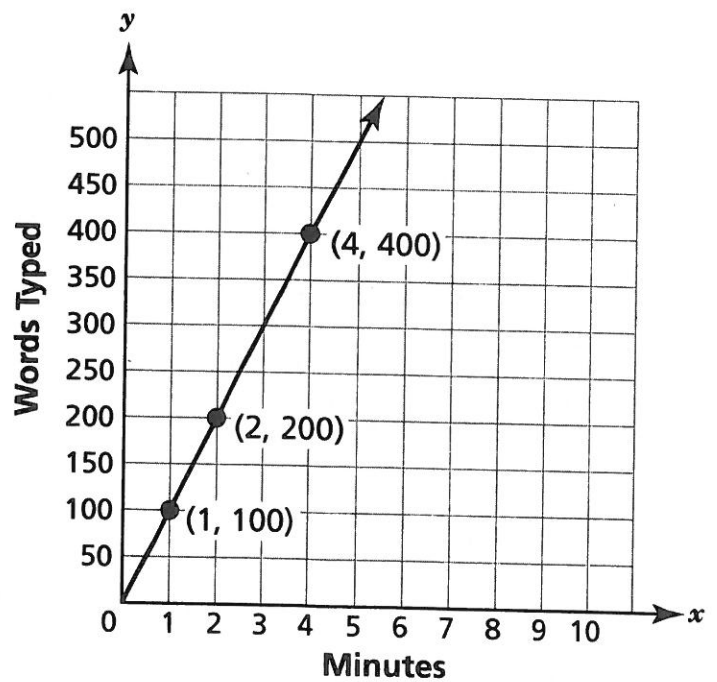

A (graph with points (3, 120), (5, 200), (10, 400); x-axis Minutes, y-axis Words Typed)

C (graph with points (2, 100), (5, 250), (8, 400); x-axis Minutes, y-axis Words Typed)

B (graph with points (2, 50), (6, 150), (8, 200); x-axis Minutes, y-axis Words Typed)

D (graph with points (1, 100), (2, 200), (4, 400); x-axis Minutes, y-axis Words Typed)

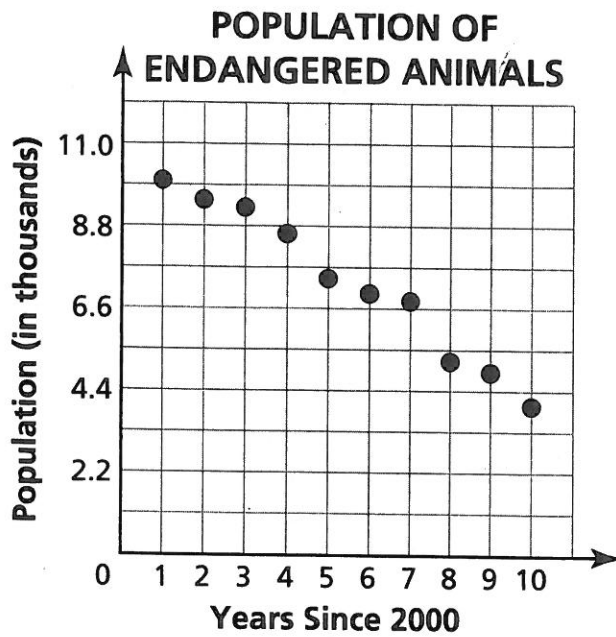**44** Suppose rectangle *ABCD* in the figure below is rotated 90° counterclockwise about the origin, resulting in rectangle *A'B'C'D'*.
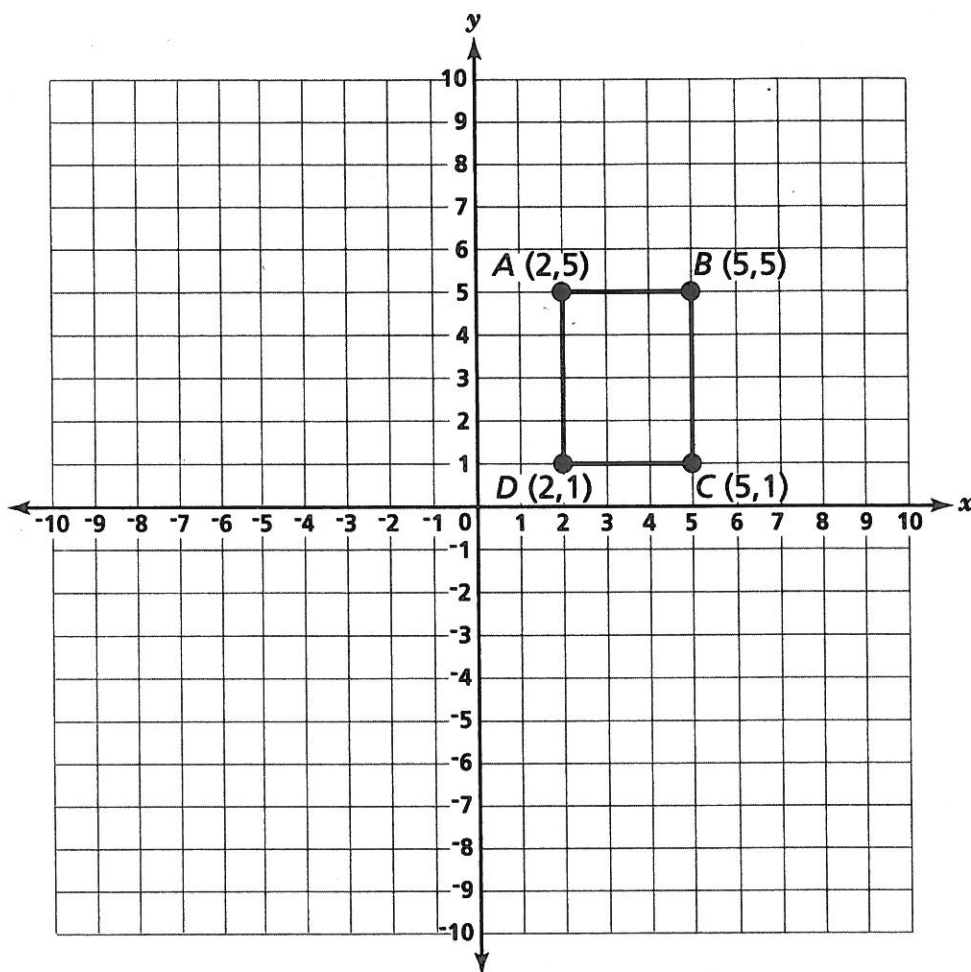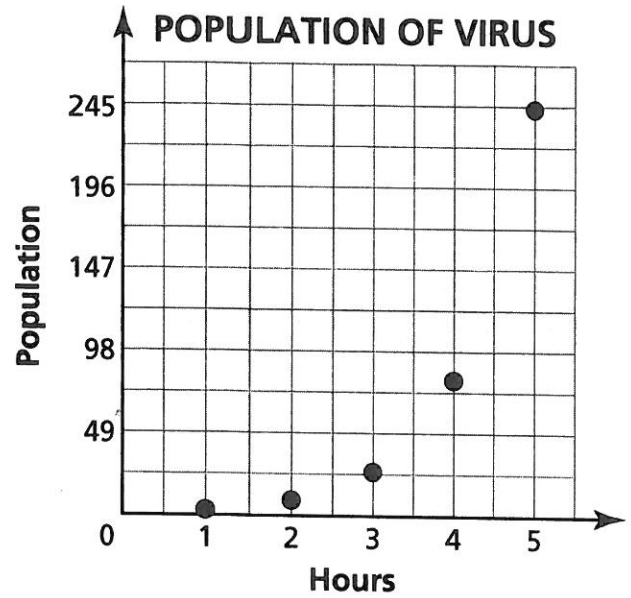

What would be the coordinates of the vertices of rectangle *A'B'C'D'*?

A   *A'*(2, 5), *B'*(5, 5), *C'*(5, 1), *D'*(2, 1)

B   *A'*(2, ⁻5), *B'*(5, ⁻5), *C'*(5, ⁻1), *D'*(2, ⁻1)

C   *A'*(⁻5, 2), *B'*(⁻5, 5), *C'*(⁻1, 5), *D'*(⁻1, 2)

D   *A'*(5, ⁻2), *B'*(5, ⁻5), *C'*(1, ⁻5), *D'*(1, ⁻2)

Go On

45 Which scatter plot shows a linear association?

POPULATION OF ENDANGERED ANIMALS

A

POPULATION OF VIRUS

C

NUMBER OF ANIMALS ADOPTED

B

STUDENTS' COUSINS

D
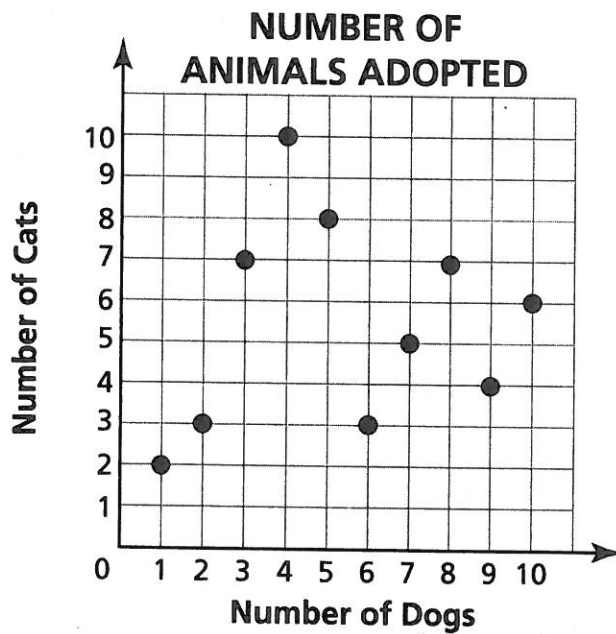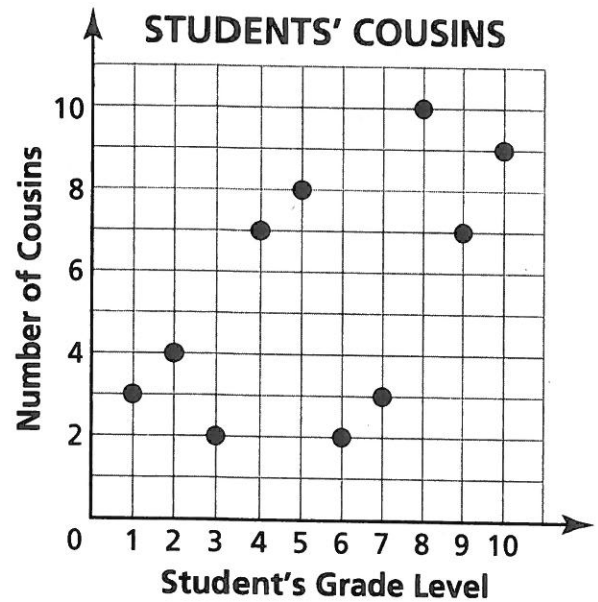
46 Consider the two scenarios below.

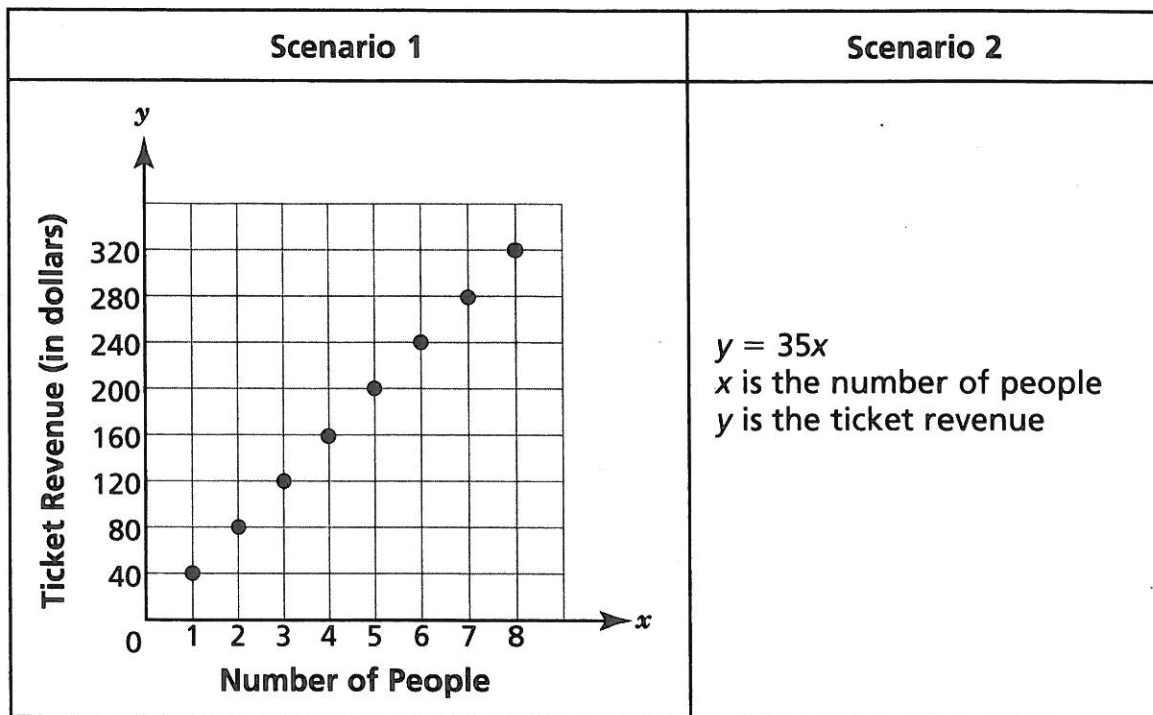| Scenario 1	Scenario 2
	$y = 35x$ x is the number of people y is the ticket revenue

In which scenario does ticket revenue increase faster?

A   Scenario 2 because that unit rate is $35.

B   Scenario 1 because that unit rate is $30.

C   Scenario 1 because that unit rate is $40.

D   Neither because the unit rates are equal.

47 Which expression is *not* equivalent to $\frac{1}{16}$?

A $4^{-9} \times 4^7$

B $4^9 \times 4^{-7}$

C $4^{10} \times 4^{-12}$

D $4^5 \times 4^{-7}$

Go On

48 The graphs below show savings over time for two bank accounts.
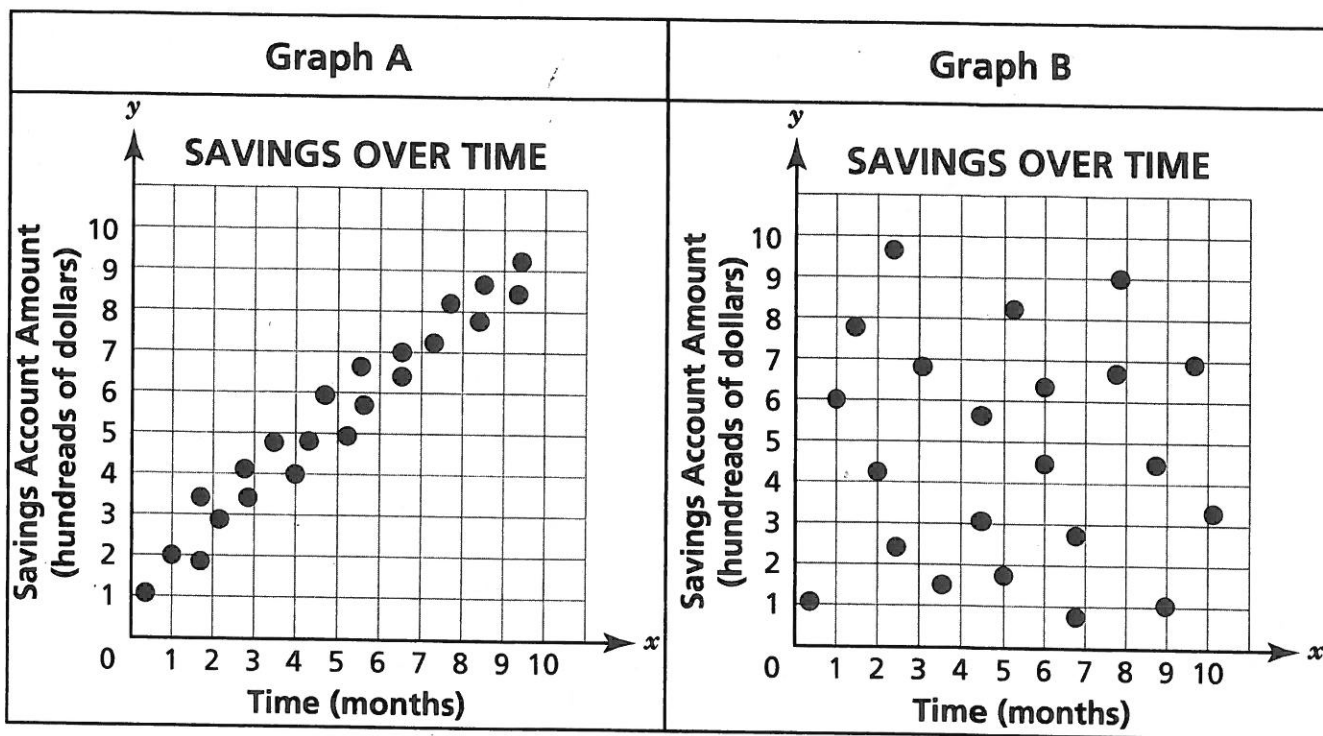
Graph A	Graph B

Which of the two graphs show clustering?

A only graph A

B only graph B

C both graph A and graph B

D neither graph A nor graph B

Go On

49 Bryce is deciding whether a graph is a function. What feature of the graph assures that the graph is a function?

A   The graph has a vertical line of symmetry.

B   The graph has a horizontal line of symmetry.

C   Every possible horizontal line that can be drawn will intersect the graph at only one point.

D   Every possible vertical line that can be drawn will intersect the graph at only one point.

50 An athletic department sold 454 tickets to a sporting event. Adults paid $3.50 per ticket, and students paid $1.00. The total ticket sales were $1,154. How many adult tickets and how many student tickets were sold to the event?

A   25 adult tickets and 429 student tickets were sold.

B   148 adult tickets and 306 student tickets were sold.

C   174 adult tickets and 280 student tickets were sold.

D   280 adult tickets and 174 student tickets were sold.

51 Which statement correctly describes the graph of $y = 3x + 5$?

A   It is not a function.

B   Its graph is not a straight line.

C   It is a nonlinear function.

D   It is a linear function.

52 The scatter plot below lists the number of entrants in a marathon race from 2000 to 2006.

MARATHON ENTRANTS
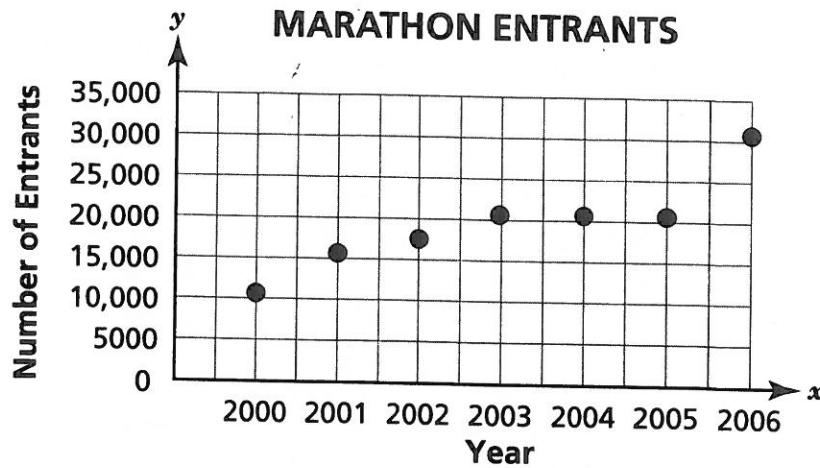
How could the association between the year and number of entrants be described?

A   There is a positive association.

B   There is a negative association.

C   The data have no outliers.

D   There is no association.

53 The gate for a picket fence has two cross braces as shown in the diagram below. The two horizontal braces are parallel, as are the vertical posts, and the horizontal braces are perpendicular to the vertical posts. The measure of ∠3 is 24°.
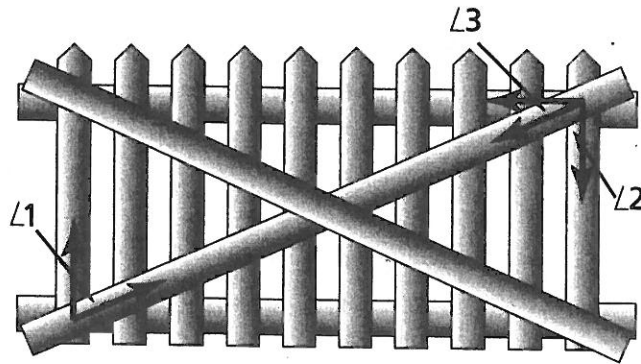
Which explanation could be used to find the measure of ∠1?

A Since ∠2 and ∠3 are complementary angles, $m\angle 2 = 66°$. ∠1 and ∠2 are alternate exterior angles, so $m\angle 1 = 66°$.

B Since ∠2 and ∠3 are supplementary angles, $m\angle 2 = 156°$. ∠1 and ∠2 are alternate interior angles, so $m\angle 1 = 156°$.

C Since ∠2 and ∠3 are complementary angles, $m\angle 2 = 66°$. ∠1 and ∠2 are alternate interior angles, so $m\angle 1 = 66°$.

D Since ∠2 and ∠3 are supplementary angles, $m\angle 2 = 156°$. ∠1 and ∠2 are corresponding angles, so $m\angle 1 = 156°$.

Go On

If Hector dilates Figure A with the center of dilation at (0, 0) and a scale factor of 2, and then translates the figure 1 unit to the left, what will be the coordinates of the vertices of the similar figure that results?
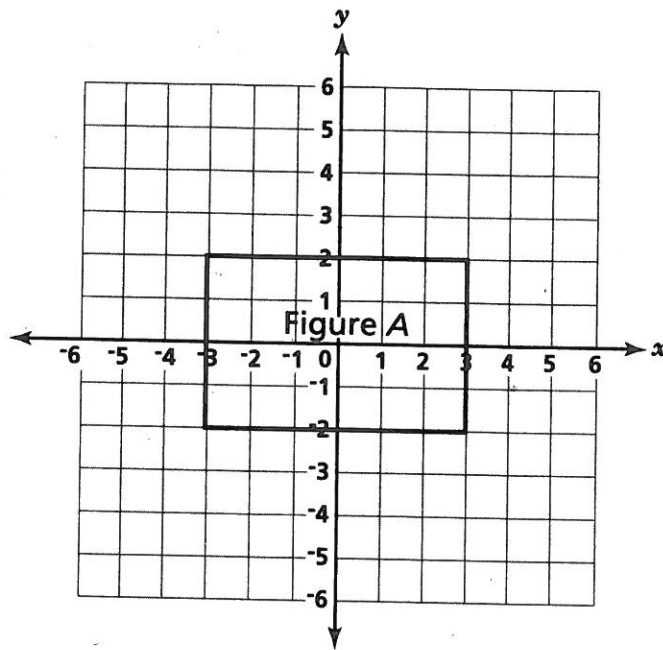
A   (−7, −4), (−7, 4), (5, 4), and (5, −4)

B   (−6, −6), (−6, 2), (6, 2), and (6, −6)

C   (−6, −5), (−6, 3), (6, 3), and (6, −5)

D   (−8, −4), (−8, 4), (4, 4), and (4, −4)

55 As part of a group exercise, four students each randomly selected three cards with angle measures written on them. The table shows the results.

Name	Angle Measures
Aella	60°, 25°, 95°
Aisha	100°, 90°, 170°
Ah Lam	90°, 60°, 45°
Andrew	35°, 35°, 35°

Which student selected angle measures that could form a triangle?

A Aella

B Aisha

C Ah Lam

D Andrew

STOP