Name

Answer items 1 through 28. You may NOT use a calculator.

1 The table shows the numbers of wins and losses Ali's softball team had while playing on its home field and on its opponents' fields.

|	Home Field	Opponents' Fields
Wins	15	9
Losses	6	12
Total	21	21

Approximately what percentage of the games on its opponents' fields did Ali's team lose?

A   38%

B   43%

C   57%

D   67%

2 Exercise Plus charges a yearly fee of $75 plus $10 a month. Gym and Swim charges a yearly fee of $50 plus $15 a month. After how many months is the cost the same?

A   The cost is the same at 5 months.

B   The cost is the same at $\frac{2}{3}$ of a month.

C   The cost is the same each month.

D   The cost is never the same.

Go On

3 Mrs. Sinclair showed this graph to her students. Iona said the graph is not a function.
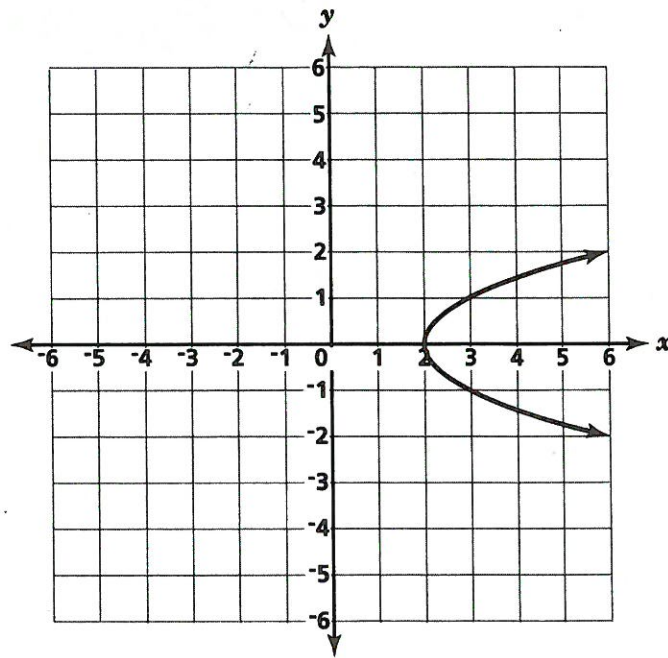
What is the **best** reason she could give to support her statement?

A   There are two y–values for each x–value greater than 2.

B   The x–values are only in Quadrant I.

C   For $x < 2$, y–values are not defined.

D   Every x–value has a single y–value.

4   Consider the equation below.

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

Which statement *best* describes the solution?

A   The equation has infinitely many solutions.

B   The equation has one solution, $x = 0$.

C   The equation has one solution, $x = \frac{3}{5}$.

D   The equation has no solution.

5   Kalinda monitors her heart rate while exercising. The linear equation that models her heart rate while exercising is $y = 8x + 73$. Which statement explains the meaning of the y–intercept?

A   The heart rate steadily increases while exercising.

B   The heart rate increases 8 beats per minute.

C   The heart rate does not increase very much.

D   The starting heart rate is 73 beats per minute.
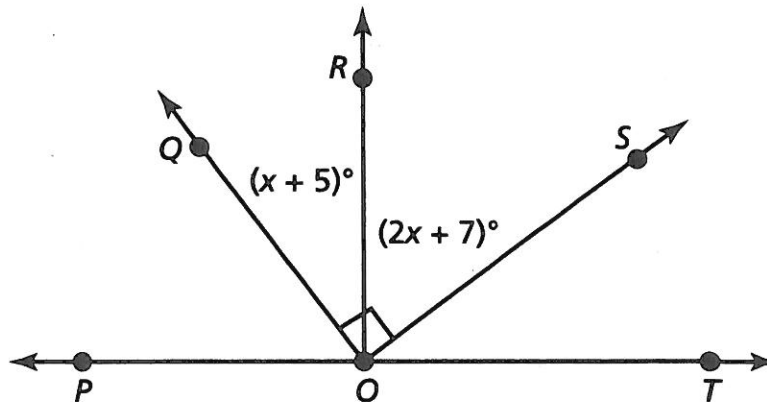
Go On

6 Consider the table below.

x	y
−1	4
1	10
3	16

What are the slope, *m*, and *y*–intercept of the function?

A $m = \frac{1}{3}$, *y*–intercept = 6

B $m = -\frac{1}{3}$, *y*–intercept = 6

C $m = 3$, *y*–intercept = 7

D $m = -3$, *y*–intercept = 7

7 The figure below shows several rays that share a common endpoint.

What is the measure of ∠*QOR*?

A   61°

B   59°

C   31°

D   26°

8 Three functions are shown below.

Function 1: Marco takes the train to work. He buys a $40 train card each month, and $1.50 is deducted from its value for each day that he takes the train.

Function 2: Isano drives a car to work. The equation $E = 3d + 10$ represents Isano's travelling expenses each month, where d is the number of days she drives her car.

Function 3: Paulo rides a bike to work. His expense is the same each day, and his total expenses for 1 work week are modeled in the table below.

Days	Total Expenses, $
1	0.75
2	1.50
3	2.25
4	3.00
5	3.75

Whose work travel expenses change the most each day?

A   Each person's expenses change the same amount each day.

B   Paulo's expenses change the most.

C   Isano's expenses change the most.

D   Marco's expenses change the most.

9 How many times as large is the approximate radius of a mercury atom, 1.50×10^{-10} meter, as the approximate radius of a hydrogen atom, 2.5×10^{-11} meter?

A $\frac{1}{6}$ times

B   0.6 times

C   6 times

D   60 times

Go On

10 What is the rate of change and initial value of the linear function modeled by a line passing through the points (0, 8) and (3, −1)?

A   rate of change: −3; initial value: 8

B   rate of change: −3; initial value: −8

C   rate of change: 8; initial value: 3

D   rate of change: 8; initial value: −3

11 Which transformation on the parallelogram below will create a congruent image with the same coordinates as vertices?
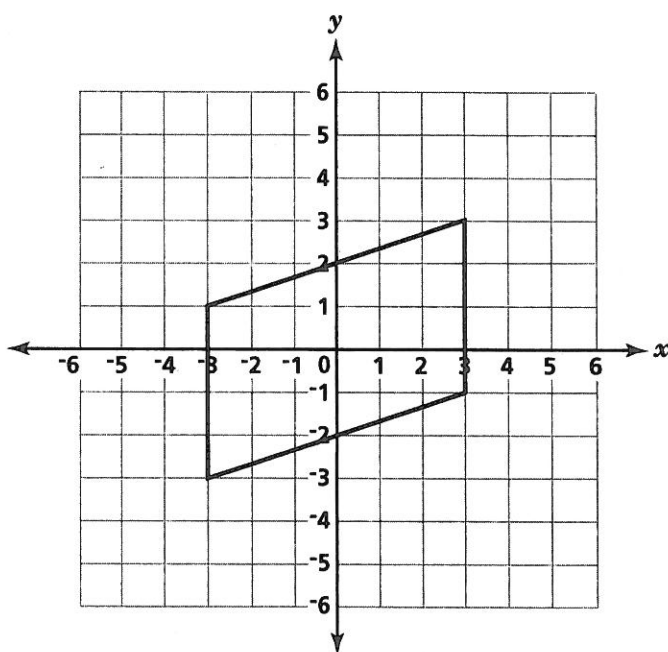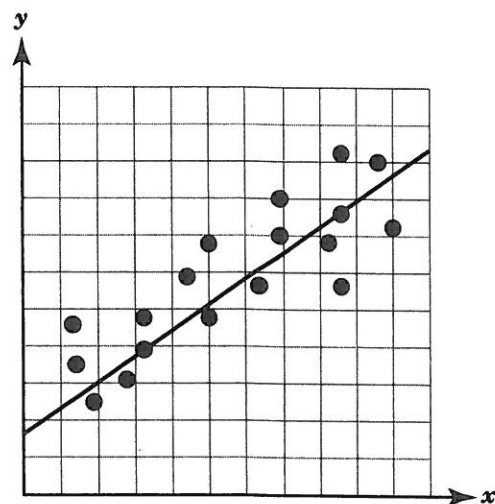

A   A reflection over the y-axis.

B   A reflection over the line y = x.

C   A clockwise rotation of 90° about the origin.

D   A counterclockwise rotation of 180° about the origin.

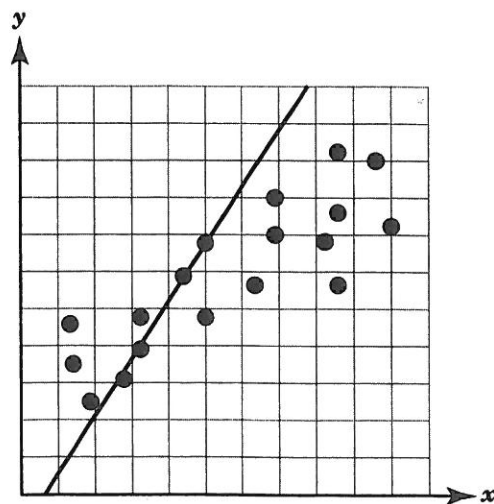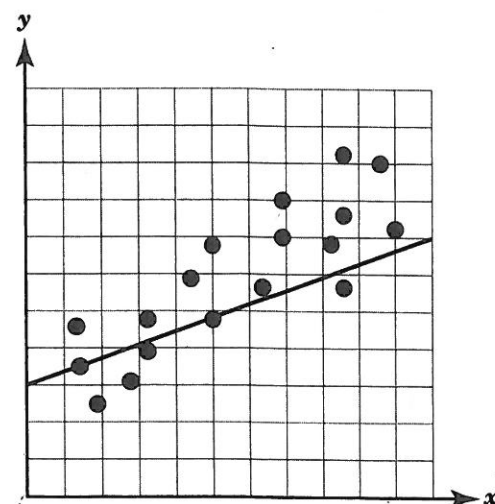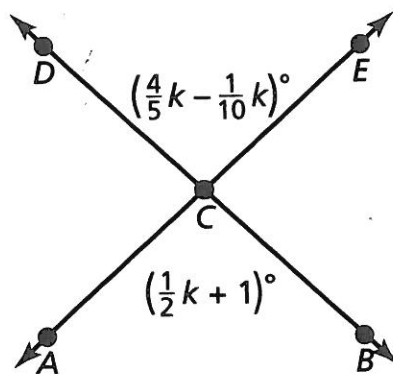**12** Which graph *best* models the line of best fit for the data in the scatter plot?

A

C

B

D

Go On

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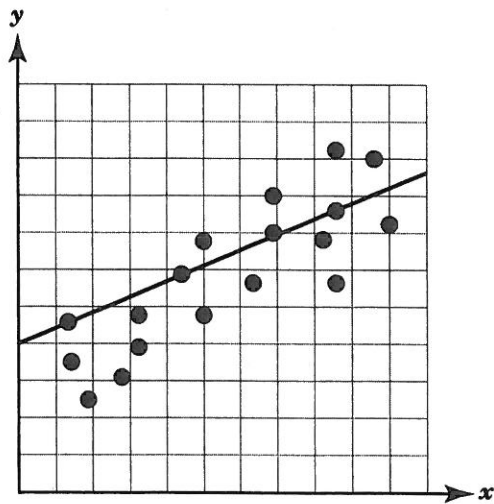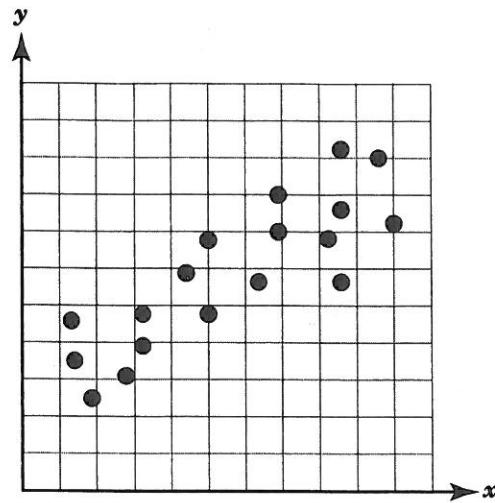
13 In the diagram below $m\angle ACB = m\angle DCE$.

$$\left(\tfrac{4}{5}k - \tfrac{1}{10}k\right)^\circ$$

$$\left(\tfrac{1}{2}k + 1\right)^\circ$$

D   E

C

A   B

What is the value of k?

A 4

B 5

C 6

D 7

14 What is the value of the expression $\dfrac{3^{-3} \times 3^8}{3^6}$?

A $\dfrac{1}{81}$

B $\dfrac{1}{3}$

C 3

D 81

15 In the graph below, time is shown on the *x*–axis and distance is shown on the *y*–axis. The slope of a segment represents the speed during that interval.

Distance-Time Graph
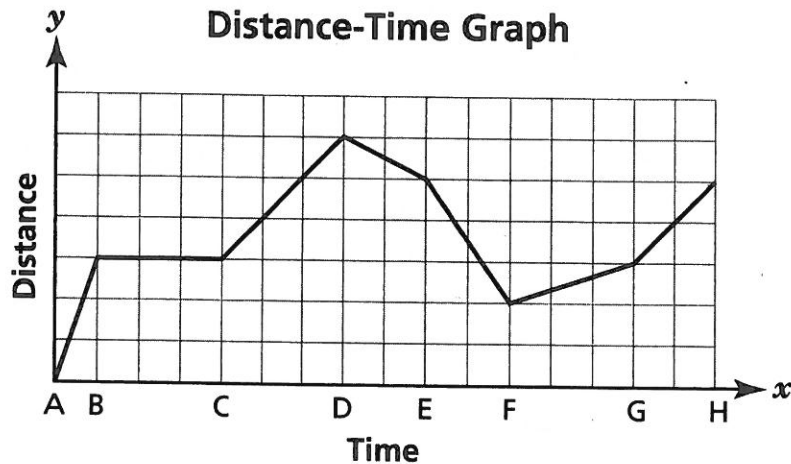
Which statement is *true*?

A The object is moving closer to its starting position most quickly between A and B.

B The object is moving closer to its starting position most quickly between E and F.

C The object is moving farther away from its starting position most quickly between C and D.

D The object is moving farther away from its starting position most quickly between D and E.

Go On

16 The table models the amount of cold medicine Meg took on each of 3 days. What is the rate of change?

Day	Amount (mg)
1	60
2	50
3	40

A   −5 mg per day

B   −10 mg per day

C   10 mg per day

D   5 mg per day

17 At what point do the graphs of the equations below intersect?

$$4x - 5y = -2$$

$$4x + 5y = 2$$

A $(-2, 2)$

B $\left(-\frac{1}{2}, 0\right)$

C $\left(1, \frac{6}{5}\right)$

D $\left(0, \frac{2}{5}\right)$

18 A restaurant hostess is paid $50 plus 10% of the waitstaff's tips for each night she works. If y represents her pay each night and x represents the waitstaff's tips, which equation models this relationship?

A $y = 50.1 + x$

B $y = 0.1 + 50x$

C $y = 50 + 0.1x$

D $y = 50.1x$

19 The table below lists the lengths of vines of different amounts of time after planting. The line of best fit for the data is $y = 0.48x - 2.97$.

Days After Planting	Vine Length (centimeters)
10	2.7
15	4.4
20	6.3
25	8.5
30	10.9
35	13.6
40	16.4
45	19.6

What is the meaning of the slope of the equation?

A For every decrease in number of days by 1, the vine length decreases by 1 centimeter.

B For every decrease in number of days by 1, the vine length decreases by 2.97 centimeters.

C For every increase in number of days by 1, the vine length increases by 1 centimeter.

D For every increase in number of days by 1, the vine length increases by 0.48 centimeters.

Go On

20 The table below lists ordered pairs of a function.

x	y
0.8	7
1	8
1.5	11
2.5	15
3.1	17
3.6	20

Is the function linear or nonlinear, and why?

A   It is nonlinear, because the rate of change is not constant.

B   It is nonlinear, because the rate of change is not positive.

C   It is linear, because the rate of change is constant.

D   It is linear, because the rate of change is positive.

21 In the equations $6x - 12y = a$ and $3x - 6y = b$, a and b are constants. The two equations have infinitely many solutions. What is the relationship between a and b?

A $a = b$

B $a = \dfrac{b}{2}$

C $a = 2b$

D $a = -b$

22 Leora created the table below to show how her family shared photographs over the past year.

	Color	Black & White
Printed	75	25
Shared Online	150	5

Of the photographs that Leora's family shared, what percentage were color photos that were shared online? Round your answer to the nearest tenth.
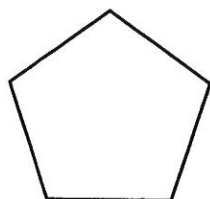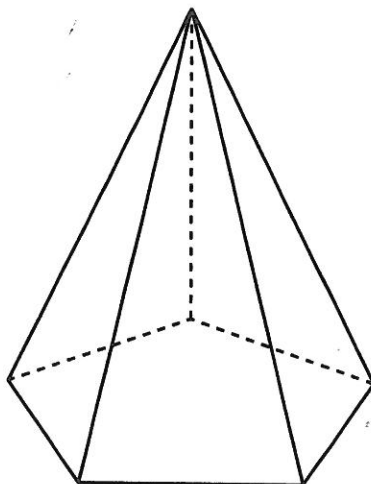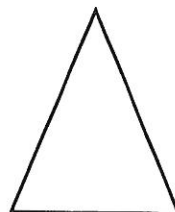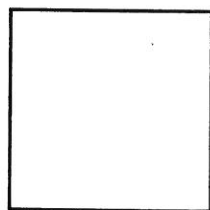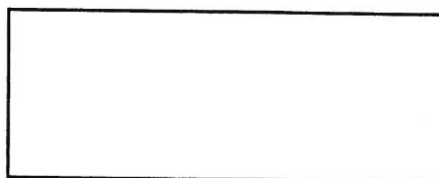
A   1.9%

B   9.8%

C   33.3%

D   58.8%

23 Adult humans have, on average, 25,000,000,000,000 red blood cells. What is that number written in scientific notation?

A 2.5×10^{12}

B 2.5×10^{13}

C 2.5×10^{14}

D 2.5×10^{5}

Go On

24 Which figure results from slicing the pyramid below with a plane through the vertex that is perpendicular to the base?

A

C

B

D

25 Ardith has 3.71×10^7 bytes of space remaining on a flash drive. She needs to copy some files, each of which is about 8.2×10^4 bytes in size, onto the flash drive. About how many whole files can Ardith copy onto the flash drive?

A 4.52×10^2

B 4.52×10^3

C 4.52×10^4

D 4.52×10^1

26 A 2-mile taxi ride costs $3.90. A 5-mile ride in the same taxi costs $7.50. If x represents the miles driven and y represents the cost in dollars, which linear equation models the cost of a taxi ride?

A $y = 1.5 + 1.2x$

B $y = {}^-1.25 + 1.2x$

C $y = 3.6 + 3x$
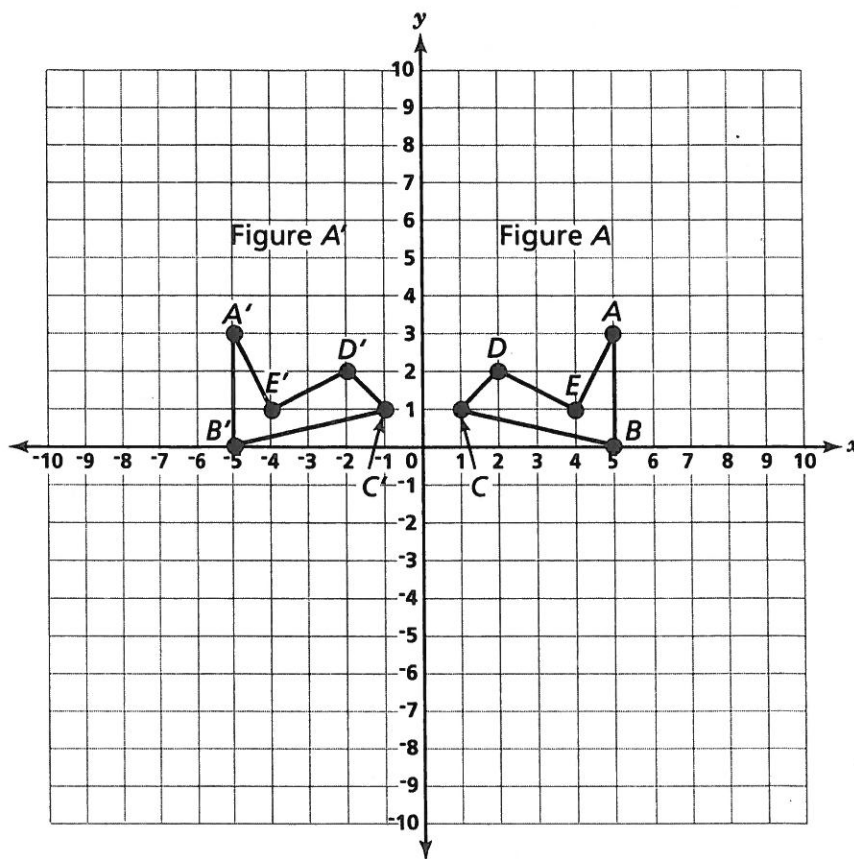
D $y = 1.2 + 1.5x$

Go On

27 A plane leaves the gate and taxis on the runway. Then, the plane ascends to its flying altitude. The plane stays at this altitude for some time. Then, the plane descends to the runway. The plane lands and taxis to the gate. Which graph shows the altitude of the airplane as it travels in time?

A

C

B

D
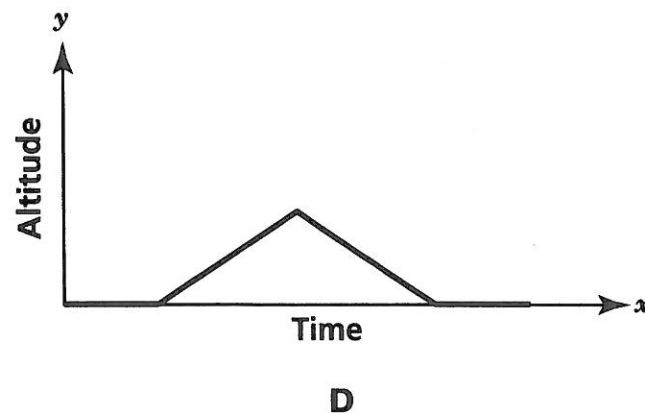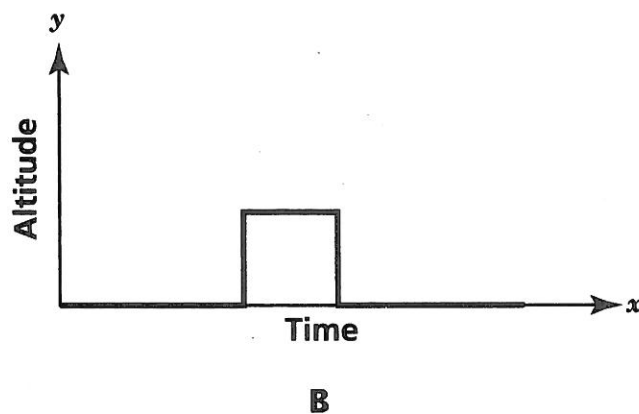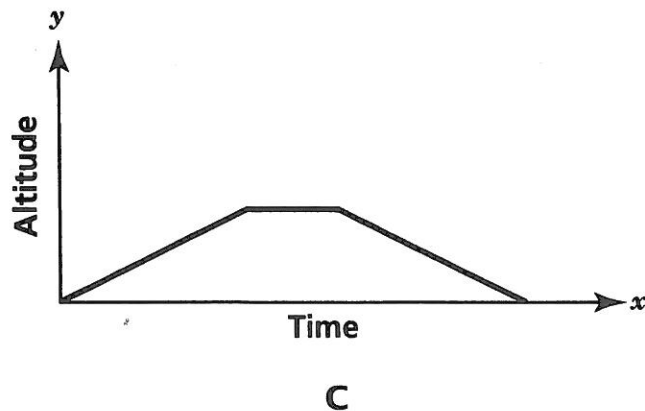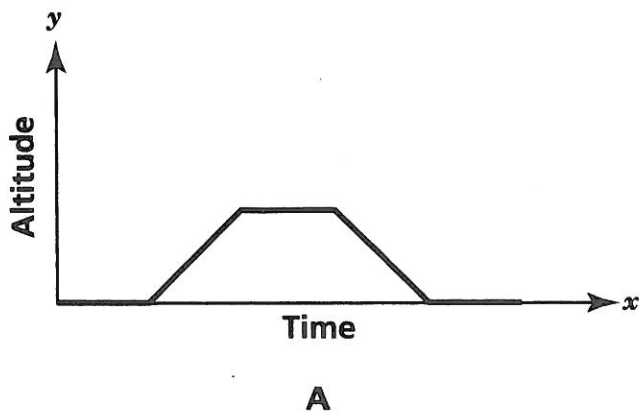
28 Look at the grid below.

Which statement is *true*?

A   Figure A is congruent to Figure A', because Figure A' is a reflection across the line *x* = *y*.

B   Figure A is congruent to Figure A', because Figure A' is a reflection across the *y*-axis.

C   Figure A is congruent to Figure A', because Figure A' is a rotation of 90° about the origin.

D   Figure A is congruent to Figure A', because Figure A' is a translation of 10 units to the left.

STOP