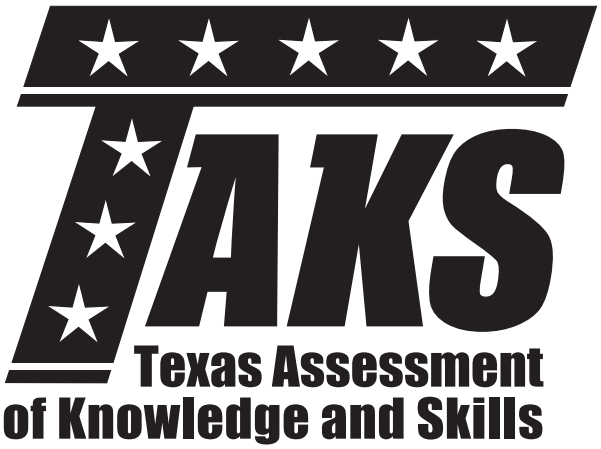
STUDENT NAME _____



EXIT LEVEL
ENGLISH LANGUAGE ARTS
MATHEMATICS
SCIENCE
SOCIAL STUDIES

Administered February 2006

Mathematics Chart

LENGTH

Metric	Customary
1 kilometer = 1000 meters	1 mile = 1760 yards
1 meter = 100 centimeters	1 mile = 5280 feet
1 centimeter = 10 millimeters	1 yard = 3 feet
	1 foot = 12 inches

CAPACITY AND VOLUME

Metric	Customary
1 liter = 1000 milliliters	1 gallon = 4 quarts
	1 gallon = 128 ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 ounces

MASS AND WEIGHT

Metric	Customary
1 kilogram = 1000 grams	1 ton = 2000 pounds
1 gram = 1000 milligrams	1 pound = 16 ounces

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Metric and customary rulers can be found on the separate Mathematics Chart.

Continued on the next page

Mathematics Chart

Perimeter	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
Surface Area	cube	$S = 6s^2$
	cylinder (lateral)	$S = 2\pi rh$
	cylinder (total)	$S = 2\pi rh + 2\pi r^2$ or $S = 2\pi r(h + r)$
	cone (lateral)	$S = \pi rl$
	cone (total)	$S = \pi rl + \pi r^2$ or $S = \pi r(l + r)$
	sphere	$S = 4\pi r^2$
Volume	prism or cylinder	$V = Bh$*
	pyramid or cone	$V = \frac{1}{3}Bh$*
	sphere	$V = \frac{4}{3}\pi r^3$
**B represents the area of the Base of a solid figure.*		
Pi	π	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Pythagorean Theorem		$a^2 + b^2 = c^2$
Distance Formula		$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Slope of a Line		$m = \frac{y_2 - y_1}{x_2 - x_1}$
Midpoint Formula		$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Quadratic Formula		$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Slope-Intercept Form of an Equation		$y = mx + b$
Point-Slope Form of an Equation		$y - y_1 = m(x - x_1)$
Standard Form of an Equation		$Ax + By = C$
Simple Interest Formula		$I = prt$

DIRECTIONS

Read each question. Then fill in the correct answer on your answer document. If a correct answer is not here, mark the letter for "Not here."

SAMPLE A

Find the slope of the line $2y = 8x - 3$.

A $-\frac{3}{2}$

B 4

C 8

D Not here

SAMPLE B

Janice uses a rectangular box to store her art supplies. The dimensions of the rectangular box are 22.5 inches by 14 inches by 11.5 inches. What is the volume of this box in cubic inches?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

1 A manufacturing company that makes semiconductors produced about 500 wafers of gallium nitride. The company found that 60 of the wafers contained defects and could not be used. Based on this information, which is the best prediction of the number of defective wafers produced when this company manufactures 8000 wafers?

A 133

B 500

C 960

D 367

2 Which of the following functions of the form $y = ax^2$ produces the widest graph and opens upward?

F $y = -\frac{1}{4}x^2$

G $y = \frac{6}{5}x^2$

H $y = -\frac{4}{3}x^2$

J $y = \frac{7}{3}x^2$

3 Which table identifies points on the line defined by the equation $y - 5x = -9$?

A

x	y
−5	−34
−2	−19
1	−9
2	11
7	26

B

x	y
−6	−39
−5	−34
1	−14
4	10
7	24

C

x	y
−4	−29
−1	−14
1	−4
3	6
6	21

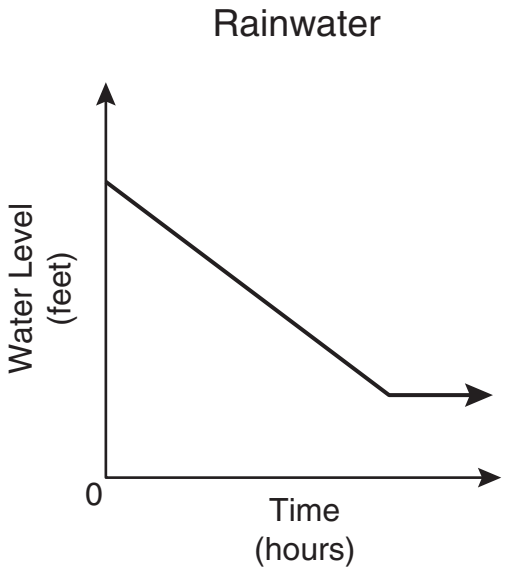
D

x	y
−7	−44
−3	−23
0	9
4	13
6	21

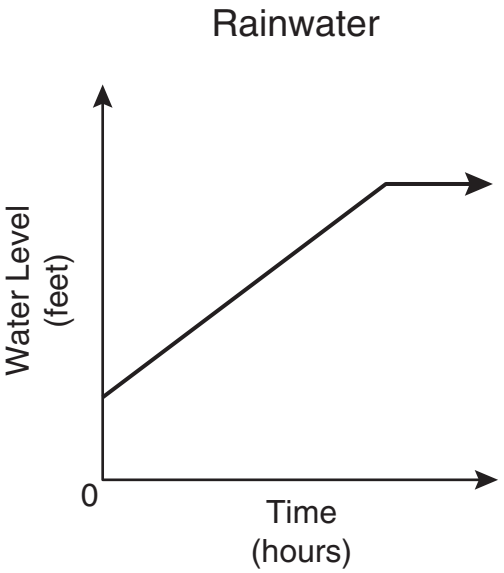
GO ON

4 The water level in a creek was at a maximum height after a heavy rain. The water level in the creek receded at a constant rate for several hours until it leveled off to its regular height. Which of the following graphs best represents this information?

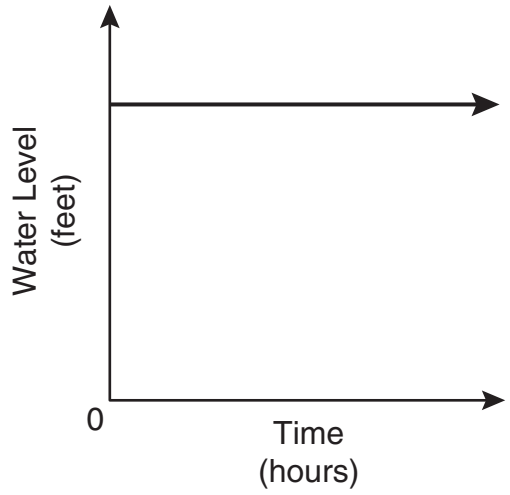
F



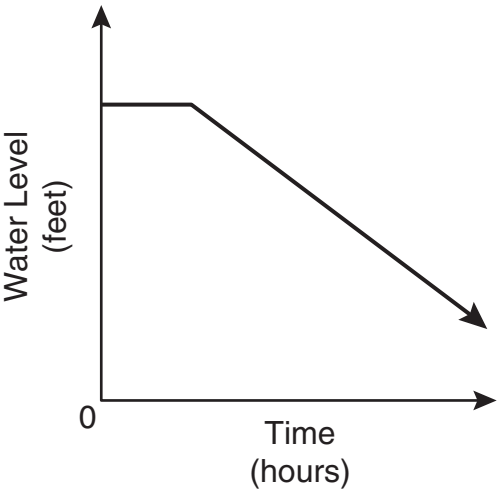
H



G



J



GO ON

5 The ratio of juniors to seniors enrolled in technology classes is 9 to 8. If the total number of juniors and seniors enrolled in these classes is 51, which of these best represents the percent of students enrolled in technology classes who are seniors?

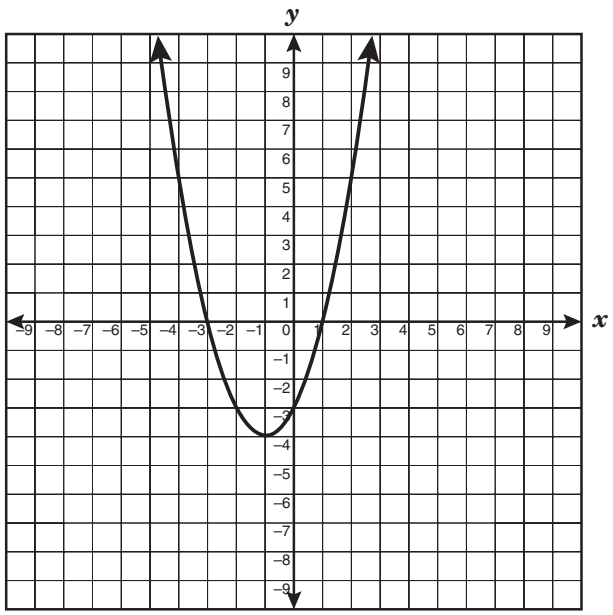
A 27%

B 24%

C 53%

D 47%

6 The graph of the function $y = x^2 + 2x - 3$ is shown below.



What are the y-intercept and x-intercepts of the function?

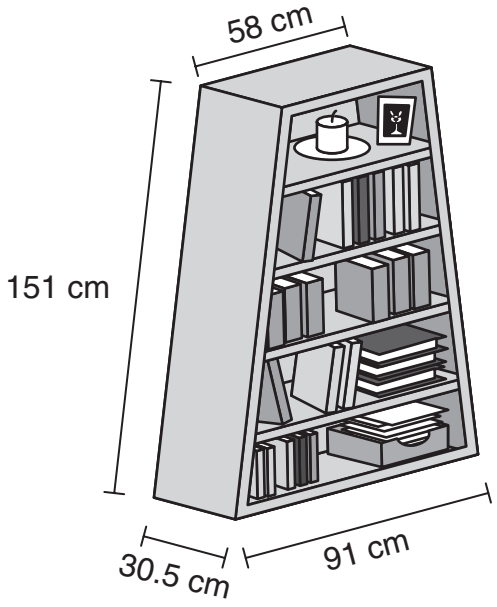
F $(0, -3), (0, 1), (-3, 0)$

G $(0, -3), (1, 0), (-3, 0)$

H $(-3, 0), (1, 0), (-3, 1)$

J $(1, -3), (0, 1), (0, -3)$

7 Mrs. Wong has a bookcase shaped like an isosceles trapezoid. The height of the bookcase is approximately 150 centimeters. The other dimensions are shown below.



Which of the following is closest to the surface area of the top, left, and right rectangular sides of Mrs. Wong's bookcase?

A 11,000 cm^2

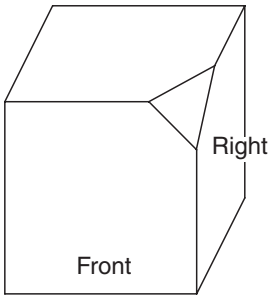
B 22,000 cm^2

C 36,000 cm^2

D 9,000 cm^2

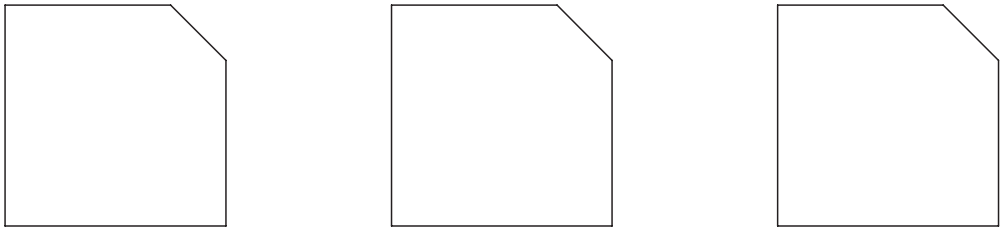
GO ON

8 The figure shown below is a cube with a corner sliced off.

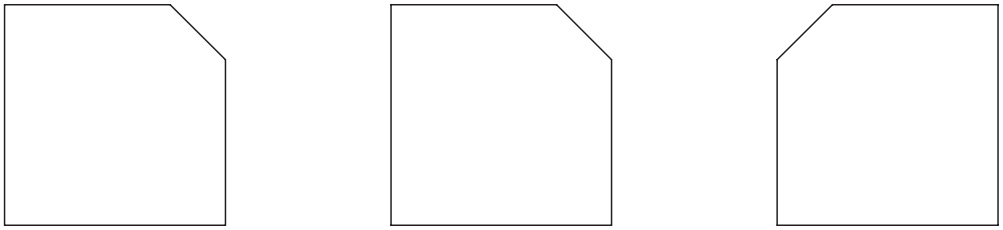


Which of the following sets of 2-dimensional drawings shows the top, front, and right views of the figure above?

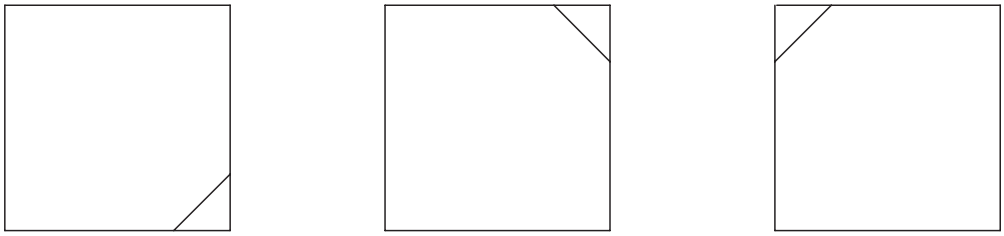
F



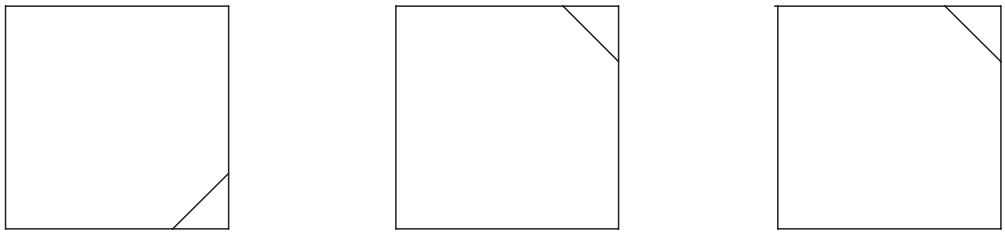
G



H

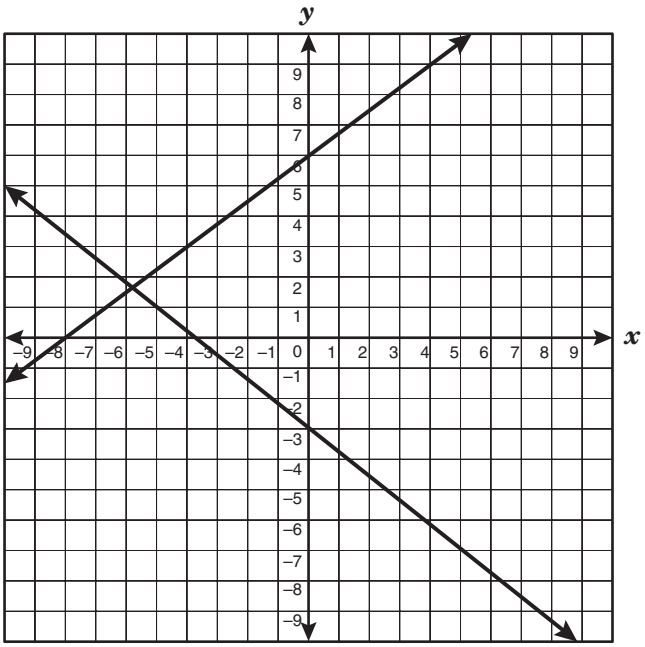


J



GO ON

9 Look at the system of linear equations graphed on the coordinate grid below.



Which of the following is closest to the solution to this system of linear equations?

A $(-5\frac{1}{2}, 2\frac{1}{4})$

B $(-5\frac{3}{4}, 1\frac{2}{3})$

C $(-6\frac{1}{4}, 1\frac{3}{4})$

D $(-5\frac{2}{3}, \frac{3}{4})$

GO ON

10 The pattern below represents the areas of several squares.

1, 9, 25, 49, ...

This pattern was formed by changing the length of the sides of the squares. How does each new length compare to the previous length?

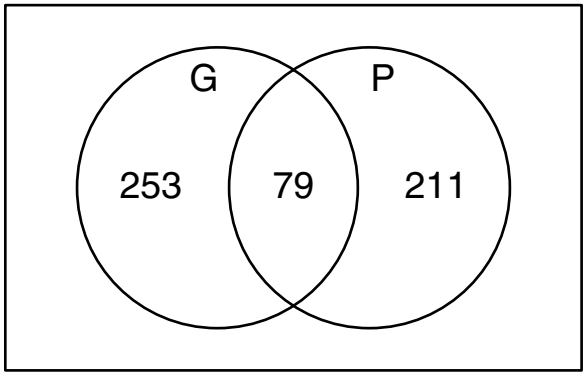
F Each new length is 2 units greater.

G Each new length is $2\frac{1}{2}$ units greater.

H Each new length is 4 units greater.

J Each new length is 8 units greater.

11 A sports-drink company surveyed 600 athletes to find out if they liked Sports Drink G or Sports Drink P. The diagram shows the results of the survey.



Which expression can be used to determine the number of athletes surveyed who did not like either Sports Drink G or Sports Drink P?

A (253 + 211)

B (253 + 79 + 211)

C 600 − (253 + 211)

D 600 − (253 + 79 + 211)

12 The total cost, c, of leasing a car can be expressed by the equation $c = 1800 + 185m$, where m is the number of months the car is leased. Which statement is true based on the information given?

F The car must be leased for at least 60 months.

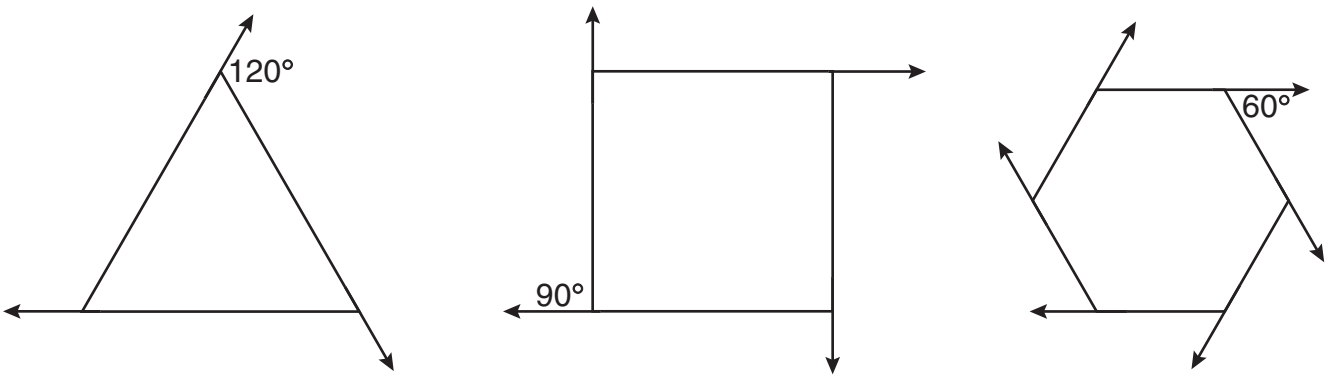
G The total cost of leasing this car for 1 year is more than \$4000.

H The total cost of leasing this car for 2 years is \$4020.

J The cost of leasing this car is greater than the cost of buying one.

GO ON

13 The measure of an exterior angle is shown for each of 3 regular polygons below.



Which expression best represents the measure in degrees of an exterior angle of a regular polygon with n sides?

A $30(n + 1)$

B $\frac{360}{(n-2)n}$

C $30(n - 1)$

D $\frac{360}{n}$

---

14 Troy used chalk to outline a triangular plot of land in his backyard. The plot of land has a perimeter of 26 feet, with its longest side measuring 8 feet 10 inches. Troy wants to outline a second triangular plot of land similar to the first but with a perimeter of 42 feet. Which of these is closest to the measure of the longest side of the second triangular plot of land?

F 17 ft 2 in.

G 13 ft 1 in.

H 14 ft 3 in.

J 17 ft 11 in.

15 The Pruitts own a natural-foods store and purchase sacks containing 5 kilograms of flax seed for $30 each. The Pruitts then package the seed into 50-gram bags. The bags cost $0.06 each. If these bags of 50 grams of seed sell for $0.98 per bag, what is the profit on a 5-kilogram sack of flax seed?

A $65

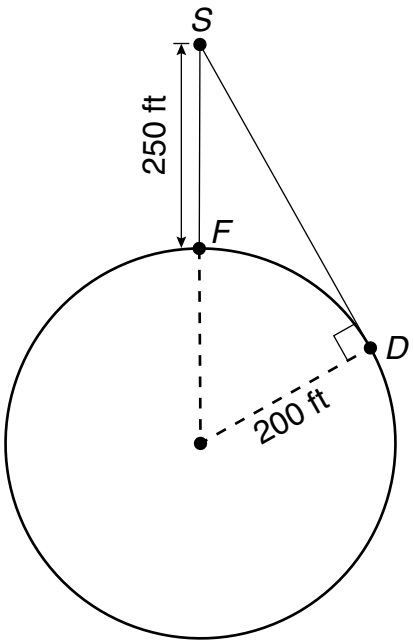
B $62

C $33

D $98

GO ON

16 Mr. Krueger attended an event at the Good Time Sports Arena. The arena is in the shape of a circle with a radius of 200 feet. He parked his car in the lot at point S, which is 250 feet away from the entrance at point F.



Mr. Krueger left the arena through the exit at point D and walked a straight-line path to his parked car. About how far away was his parked car from the exit at point D?

F 200 ft

G 403 ft

H 492 ft

J 650 ft

17 The midpoint of $\overline{AB}$ is M. If the coordinates of M are $(\frac{1}{2}, -2)$ and the coordinates of B are $(6, 1)$, what are the coordinates of A?

A $(-5, -5)$

B $(2, -10)$

C $(-3\frac{1}{4}, -1\frac{1}{2})$

D $(-5, 5)$

18 Which of the following is equivalent to $2x - 3y \geq 9$?

F $y \geq \frac{3}{2}x + 3$

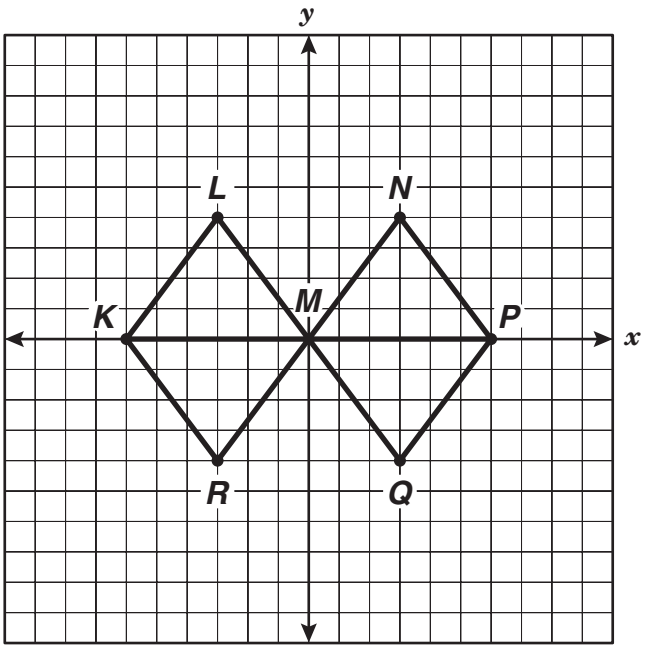
G $y \leq \frac{2}{3}x - 3$

H $y \geq \frac{2}{3}x - 3$

J $y \leq \frac{3}{2}x + 3$

GO ON

19 Look at the triangles graphed on the grid below.



Which of the following correctly describes two triangles, one a single reflection of the other across the x-axis?

A $\Delta KLM \cong \Delta PNM$

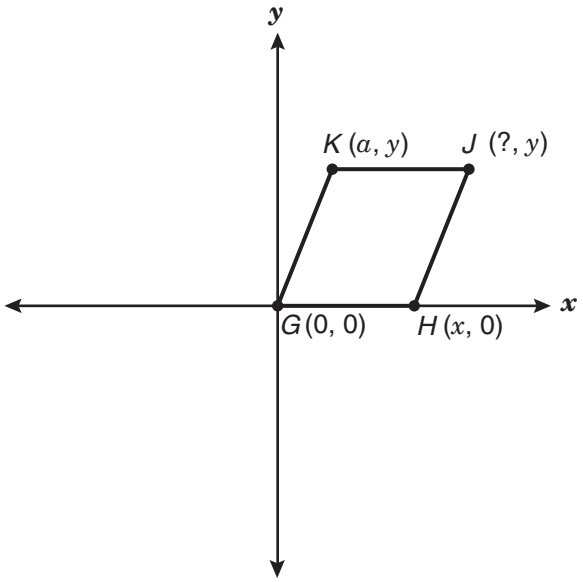
B $\Delta KRM \cong \Delta PQM$

C $\Delta KRM \cong \Delta PNM$

D $\Delta KLM \cong \Delta KRM$

GO ON

20 Parallelogram *GHJK* is shown below.



Which of the following represents the x-value of point J?

F $y - x$

G $x + y$

H $a + x$

J $x - a$

21 If y varies directly with x and y is 42 when x is 4, what is the constant of variation expressed in decimal form?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

GO ON

22 Jupiter has an equatorial diameter of about 8.9×10^4 miles, which is about 11.2 times as great as Earth's equatorial diameter. According to this information, what is Earth's approximate equatorial diameter in scientific notation?

F 2.3×10^3 mi

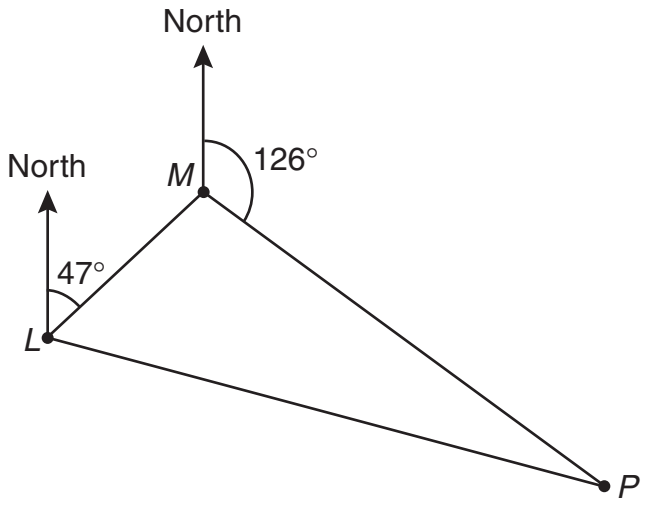
G 9.97×10^5 mi

H 7.95×10^3 mi

J 2.01×10^2 mi

---

23 The figure below shows Aaron's recent hiking course, which started at point L, went to point M and then point P, and then returned to point L.



What is the measure of $\angle LMP$ formed by Aaron's hiking course?

A 101°

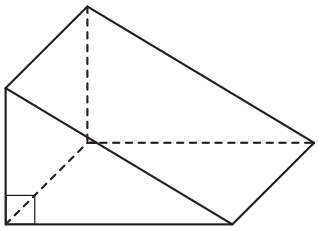
B 79°

C 54°

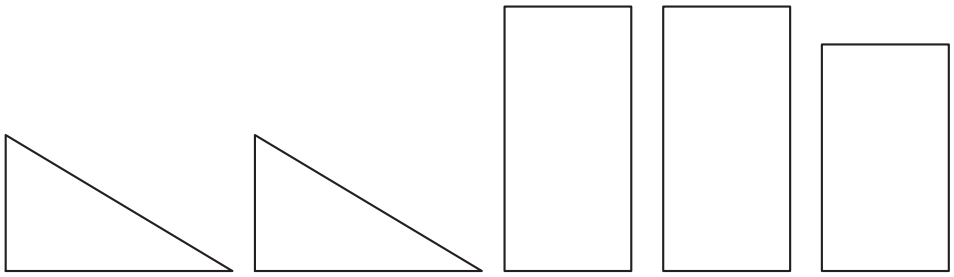
D 43°

GO ON

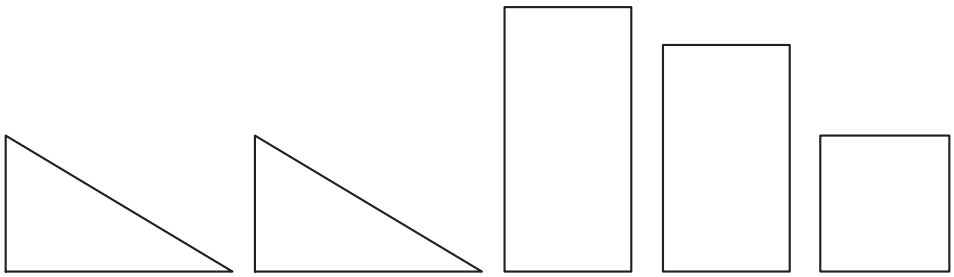
24 Which set of figures can be used to construct a representation of the surface area of the triangular prism shown below?



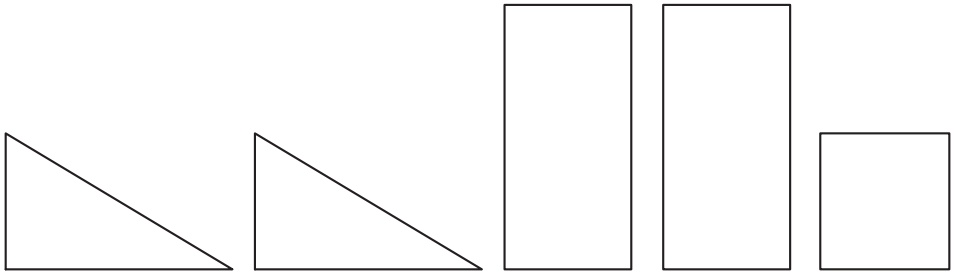
F



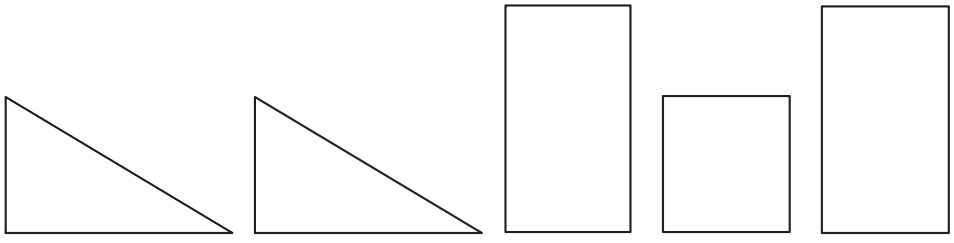
G



H



J



GO ON

25 Winners from the math club's fund-raiser randomly select a gift certificate from Box A and from Box B. The contents of each box are shown below.

Box A	Box B
5 dinner certificates	4 CD certificates
4 DVD certificates	3 camera certificates
3 movie certificates	5 amusement park certificates
5 T-shirt certificates	5 television certificates

What is the probability that the first winner will randomly select a DVD certificate and an amusement park certificate?

A $\frac{20}{289}$

B $\frac{9}{17}$

C $\frac{9}{289}$

D $\frac{1}{19}$

26 Which equation describes the line passing through the points (3, 0) and (0, 4)?

F $y = 3x + 4$

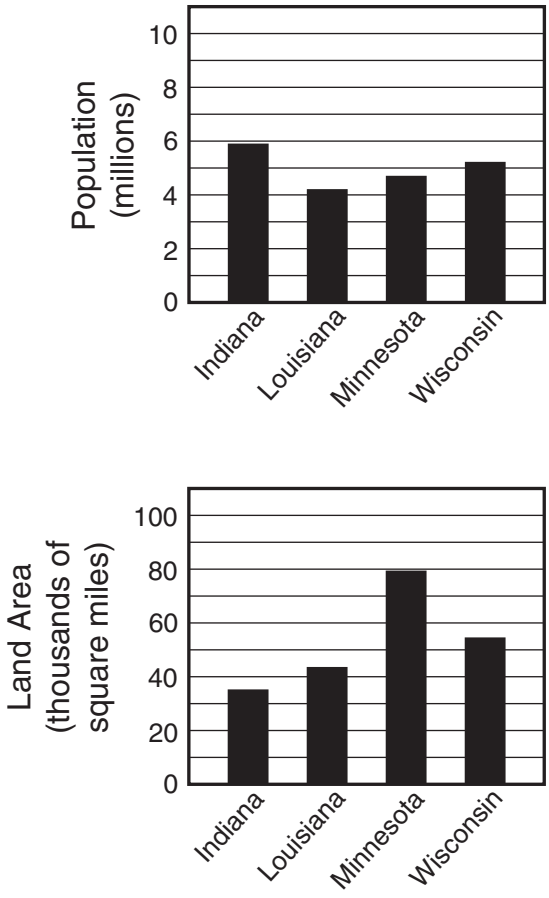
G $x = 4y + 3$

H $3x + 4y = 12$

J $4x + 3y = 12$

GO ON

27 The two bar graphs shown below represent the populations and land areas of four states.



Based on the information given in the bar graphs, which of these four states is the least densely populated?

A Indiana

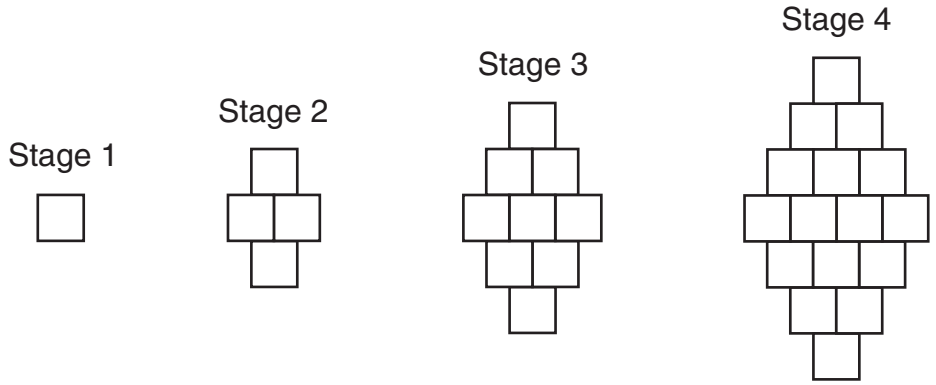
B Louisiana

C Minnesota

D Wisconsin

GO ON

28 The blocks below are arranged in sequence to show a pattern.



Which expression can be used to determine the number of blocks at Stage n?

F $\sqrt{n}$

G $(n - 1) + 1$

H $2n$

J n^2

29 A ship on the ocean left a dock, traveled 6 miles due north, and then traveled 4 miles due east. Which of the following describes the method for finding the straight-line distance from the ship to the dock?

A Use $c = 6$ and $a = 4$ in the equation $c^2 = a^2 + b^2$ and then solve for b

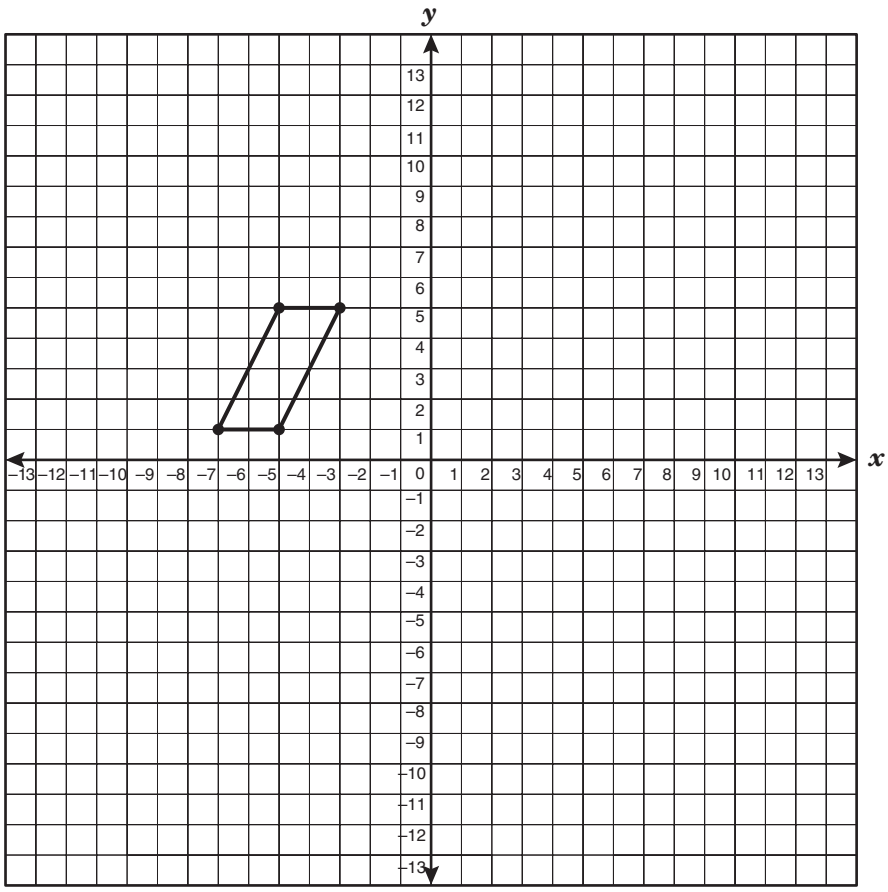
B Use $a = 6$ and $b = 4$ in the equation $c^2 = a^2 + b^2$ and then solve for c

C Use $a = 6$ and $b = 4$ in the equation $c^2 = a^2 + b^2$, solve for c, and then find $a + b + c$

D Use $c = 6$ and $a = 4$ in the equation $c^2 = a^2 + b^2$, solve for b, and then find $a + b + c$

GO ON

30 A parallelogram is graphed on the grid.



Which set of coordinates identifies the vertices of a similar figure?

F $(-2, -1), (-4, -1), (-3, -6), (-5, -6)$

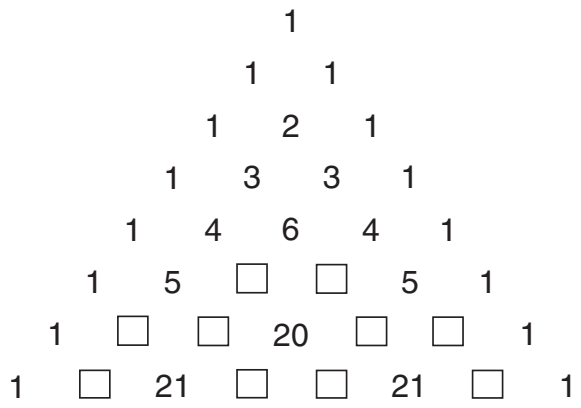
G $(0, -2), (0, -5), (8, 1), (8, -2)$

H $(1, 2), (1, 6), (9, 6), (9, 10)$

J $(-1, -1), (0, 3), (2, -1), (3, 3)$

GO ON

31 The figure below shows a partial view of Pascal's triangle.



If each square represents a missing number in Pascal's triangle, which of the following could not be a missing number used to complete the partial view of Pascal's triangle shown above?

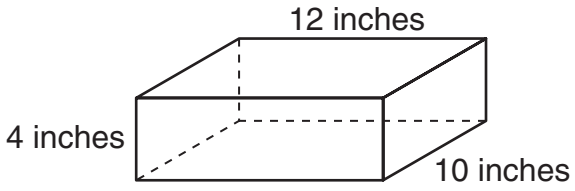
A 24

B 15

C 35

D 10

32 What is the volume of a similar rectangular box with dimensions that are 3.5 times larger than the dimensions of the rectangular box shown below?



F 5,880 in.^{3}

G 17,836 in.^{3}

H 20,580 in.^{3}

J 1,680 in.^{3}

33 Points M and N lie on circle P. If circle P has a radius r, which of the following statements cannot be true?

A $MN > r$

B $MN > 2r$

C $MN = r$

D $MN = 2r$

GO ON

34 Maricella has a bag containing 35 nickels and quarters. The total value of these coins is less than $2.50. What is the maximum number of quarters that meets these conditions?

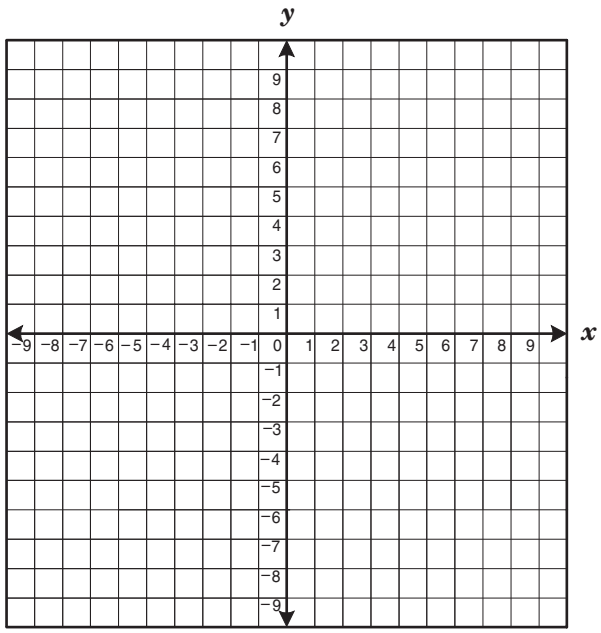
F 10

G 4

H 3

J 9

35 A right triangle has two vertices with coordinates (0, 3) and (4, 1). Which coordinate could be a third vertex of this right triangle?



A (2, 2)

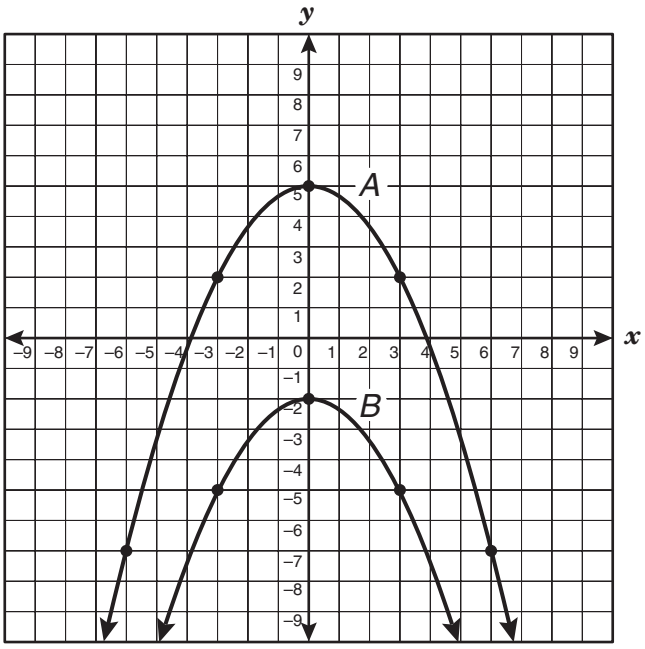
B (4, 4)

C (6, 5)

D (8, −1)

GO ON

36 The grid below shows parabolas A and B of the form $y = ax^2 + c$.



How are parabolas A and B related?

F Parabola A is narrower than parabola B.

G Parabola A is wider than parabola B.

H All the points on parabola A are 7 units below the corresponding points on parabola B.

J All the points on parabola A are 7 units above the corresponding points on parabola B.

37 If $\overline{JM}$ is a base and $\overline{LM}$ is a side of isosceles trapezoid $JKLM$, then which statement must be true?

A $\overline{JM}$ and $\overline{KL}$ are parallel.

B $\overline{LM}$ and $\overline{JK}$ are parallel.

C $\overline{JM}$ and $\overline{KL}$ are perpendicular.

D $\overline{LM}$ and $\overline{JM}$ are perpendicular.

38 In ΔPKN, $PN = 14$ inches, $m\angle N = 30°$, and $m\angle K = 90°$. Which is closest to the perimeter of ΔPKN?

F 42 in.

G 33 in.

H 31 in.

J 28 in.

GO ON

39 Hoaung went to a doughnut shop where jelly-filled doughnuts cost $0.50 including tax and glazed doughnuts cost $0.30 including tax. If Hoaung has $2 to spend and wants to purchase at least one of each of these two kinds of doughnuts, which of the following does not represent a reasonable combination of doughnuts that he could purchase?

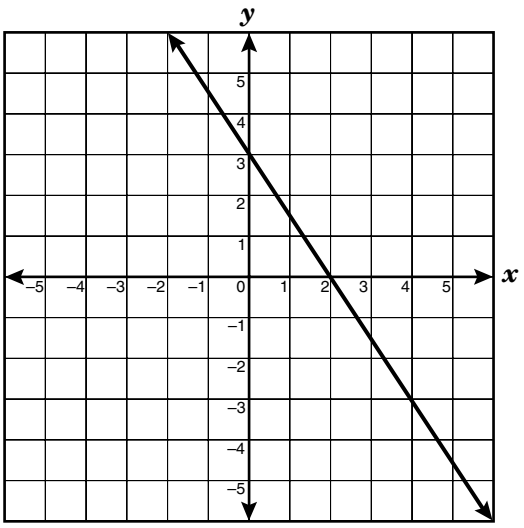
A 2 jelly-filled doughnuts and 2 glazed doughnuts

B 2 jelly-filled doughnuts and 3 glazed doughnuts

C 3 jelly-filled doughnuts and 2 glazed doughnuts

D 1 jelly-filled doughnut and 5 glazed doughnuts

40 Which equation best represents the graph below?



F $y = 3 - \frac{3}{2}x$

G $y = 3 - \frac{2}{3}x$

H $y = 3 + \frac{2}{3}x$

J $y = 3 + \frac{3}{2}x$

41 Kimberly and Pam ran a 1-mile race. If k represents the number of seconds Kimberly took to finish the race and p represents the number of seconds Pam took to finish the race, which of the following describes a situation in which Kimberly finished the race before Pam?

A $k \geq p$

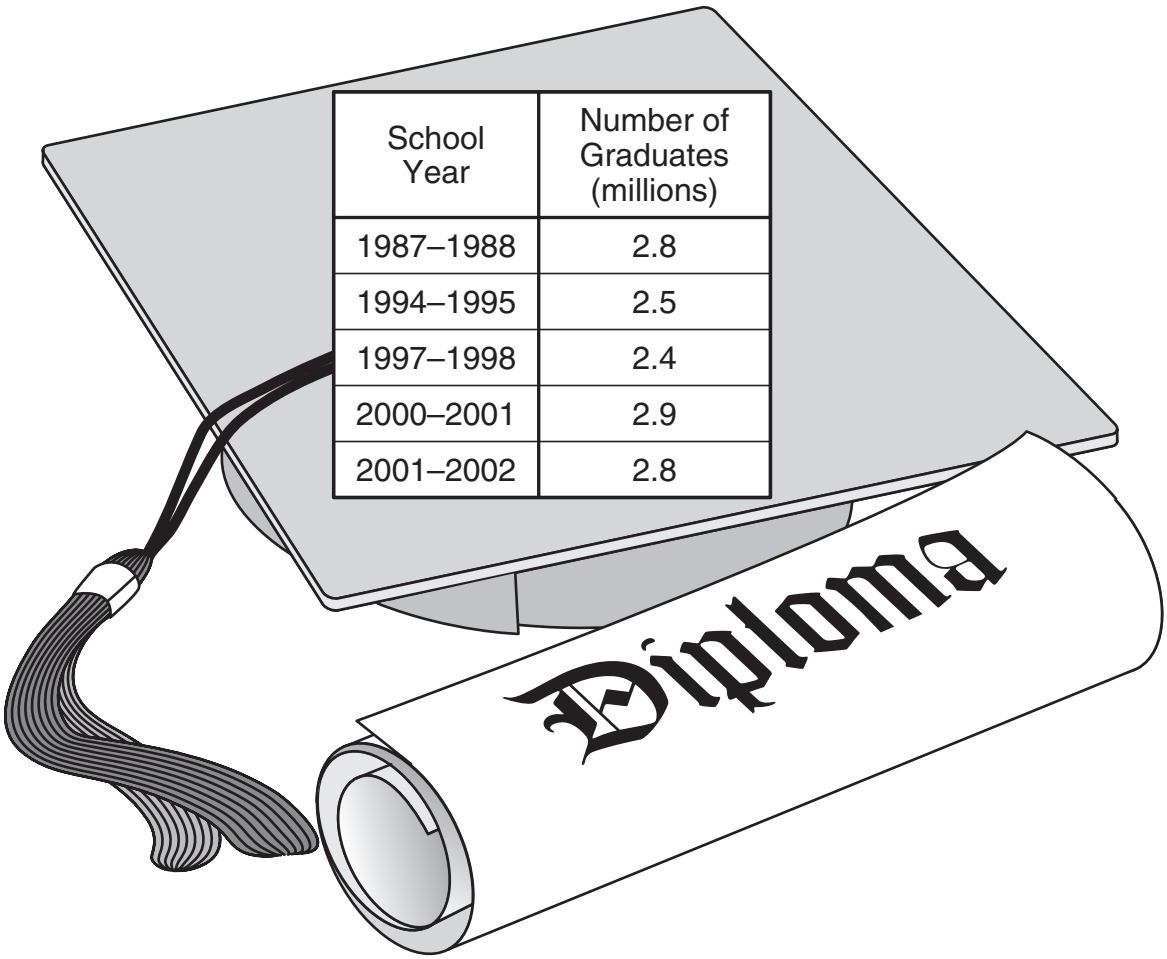
B $k \leq p$

C $k > p$

D $k < p$

GO ON

42 The table below shows selected school years and the number of high school graduates in millions.



Which statement below is best supported by the data in the table?

F The percent increase of high school graduates from the 1987–1988 school year to the 1994–1995 school year was close to 12%.

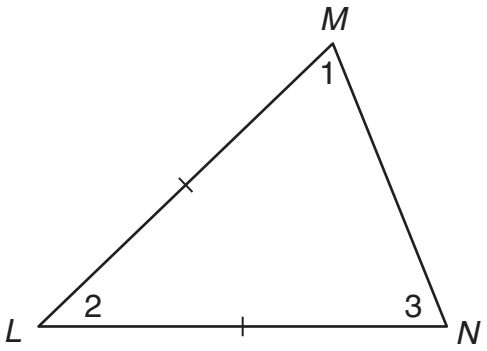
G More students graduated from public high schools than private schools during the 2000–2001 school year.

H One million more students graduated from high school during the 2000–2001 school year than graduated during the 2001–2002 school year.

J The percent increase of high school graduates from the 1997–1998 school year to the 2000–2001 school year was close to 21%.

GO ON

43 Shown below is ΔLMN, an isosceles triangle.



Which equation can be used to find the measure of the vertex angle of this isosceles triangle?

A $m\angle 1 = 180° - (m\angle 2 - m\angle 3)$

B $m\angle 2 = 180° - (m\angle 1 + m\angle 3)$

C $m\angle 3 = 180° + m\angle 1 - m\angle 2$

D $180° = m\angle 1 - m\angle 2 + m\angle 3$

44 Which of the following sets does not represent a function?

F $\{(-1, -1), (1, 1), (2, 2), (3, 3), (4, 4)\}$

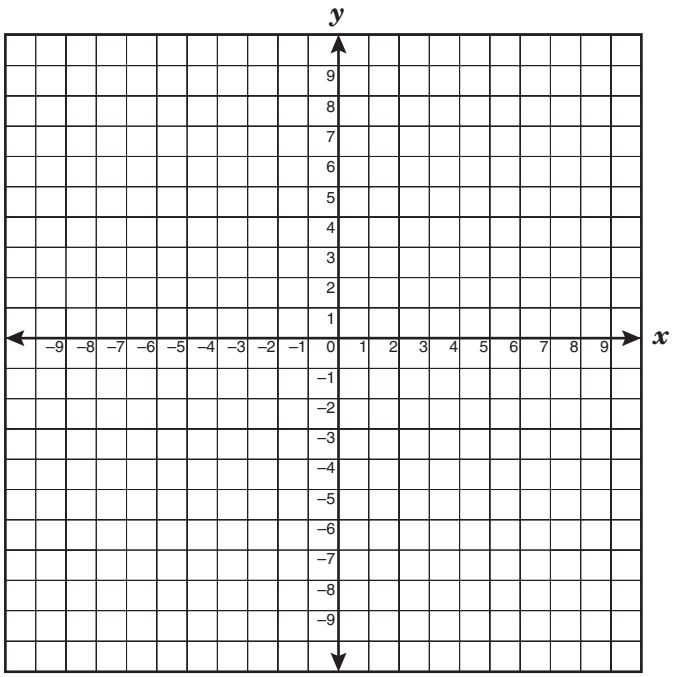
G $\{(-1, 0), (0, 2), (1, 4), (2, 6), (3, 8)\}$

H $\{(-1, 2), (1, 1), (1, -1), (2, 1), (4, 2)\}$

J $\{(-2, 4), (-1, 1), (1, 1), (2, 4), (3, 9)\}$

GO ON

45 Use the grid to graph $y \geq \frac{3}{4}x - 2$.



Which coordinate point represents a solution of this inequality?

A (4, 0)

B (−3, −5)

C (7, 2)

D (−2, 3)

---

46 Chanté bought a package of 36 tickets for carnival rides. Each ride requires 4 tickets per person. Which linear function, if any, represents the relationship between x, the number of carnival rides Chanté went on, and y, the number of tickets remaining?

F $y = 4x - 36$

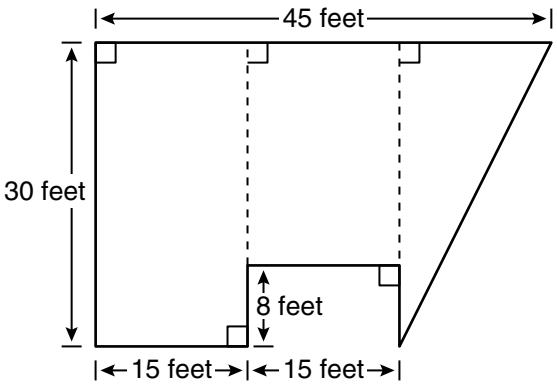
G $y = 4(x - 36)$

H $y = 36 - 4x$

J No linear function exists.

GO ON

47 Linda has divided her garden into 3 parts, as shown below.



What is the area of her garden?

A 1005 ft^2

B 1230 ft^2

C 1350 ft^2

D 1470 ft^2

48 The wheels on Lee's bike each have a circumference of approximately 7 feet. Which of the following equations could be used to determine y, the total distance traveled in feet for each wheel as a function of x, the number of wheel revolutions?

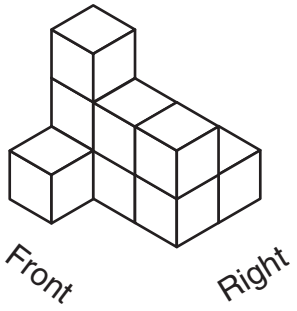
F $y = \frac{7}{x}$

G $y = 7 + x$

H $y = 7x$

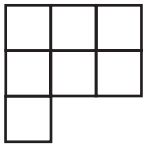
J $y = 7 - x$

49 The 3-dimensional figure shown below represents a structure that Corina built with 9 cubes.

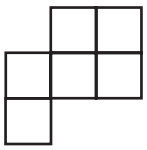


Which of the following best represents the top view of Corina's 9-cube structure?

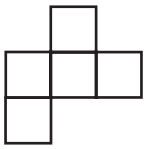
A



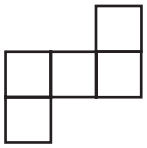
B



C

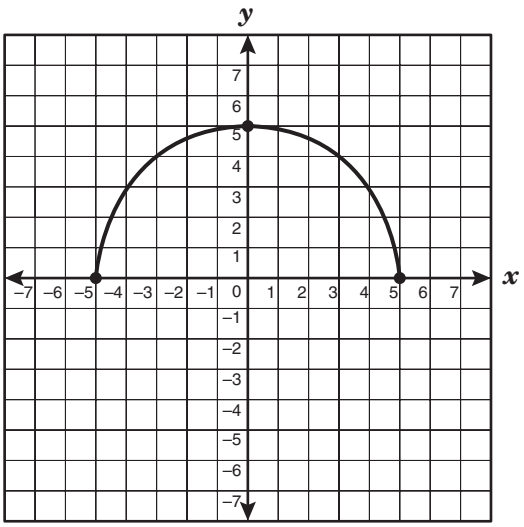


D



GO ON

50 The graph of the function $y = \sqrt{25 - x^2}$ is shown on the coordinate grid below.



What is the domain of the function?

F $x \leq 5$

G $x \geq -5$

H $-5 \leq x \leq 5$

J $0 \leq x \leq 5$

GO ON

51 A school district held a meeting for all its physical education teachers. The number of women attending was 5 more than twice the number of men attending. A total of 53 teachers attended the meeting. Which system of equations could be used to find w, the number of women, and m, the number of men, at this meeting?

A $m = 2w + 5$
$w + m = 53$

B $2w + m = 5$
$w + m = 53$

C $w = m + 5$
$w + m = 53$

D $w = 2m + 5$
$w + m = 53$

52 What is the slope of the function $-6x - 2y = 8$?

F $\frac{1}{3}$

G -3

H -4

J 3

53 A physicist determines the kinetic energy of a moving particle by multiplying one-half the particle's mass, m, by the square of the particle's velocity, v. The kinetic energy is best represented by —

A $\frac{mv^2}{2}$

B $2mv^2$

C $\frac{(mv)^2}{2}$

D $\frac{mv}{2}$

GO ON

54 Mrs. Farmer asked her students to vote for their favorite vegetable. The number of votes each vegetable received is listed below.

- Beets received 17 votes.
- Carrots received 21 votes.
- Lettuce received 21 votes.
- Broccoli received 19 votes.
- Potatoes received 22 votes.

If a circle graph is constructed using these data, which of the following tables best represents the central angle of each sector?

F

Students' Favorite Vegetable

Vegetable	Central Angle
Beets	17°
Carrots	21°
Lettuce	21°
Broccoli	19°
Potatoes	22°

H

Students' Favorite Vegetable

Vegetable	Central Angle
Beets	61°
Carrots	76°
Lettuce	76°
Broccoli	68°
Potatoes	79°

G

Students' Favorite Vegetable

Vegetable	Central Angle
Beets	61°
Carrots	76°
Lettuce	76°
Broccoli	79°
Potatoes	68°

J

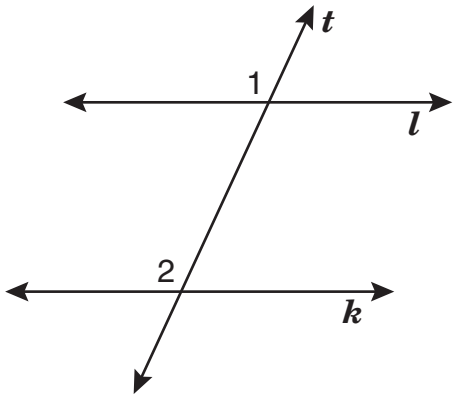
Students' Favorite Vegetable

Vegetable	Central Angle
Beets	68°
Carrots	76°
Lettuce	76°
Broccoli	61°
Potatoes	79°

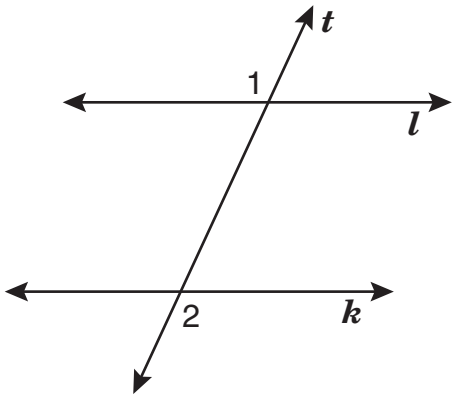
GO ON

55 Mitch drew lines l, k, and t. Lines l and k were parallel to each other. Mitch measured 2 alternate interior angles. He labeled the angles 1 and 2. Which of the following shows angles 1 and 2 correctly labeled?

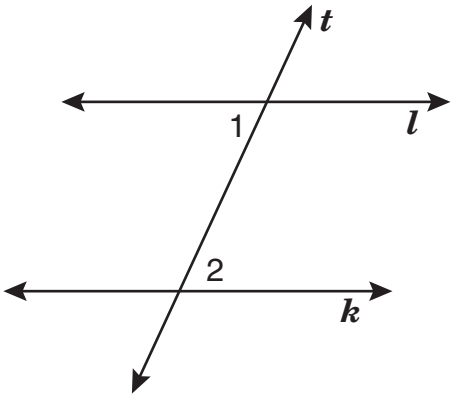
A



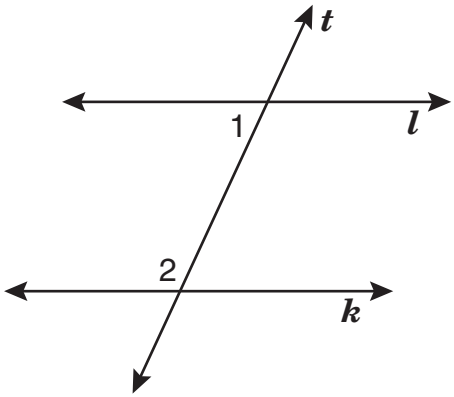
C



B



D



56 A building-trades class built a circular spinner for the school carnival. The spinner has a diameter of 48 inches and is divided into 12 congruent sectors. What is the approximate area of each of the sectors on this spinner?

F 603 in.^{2}

G 151 in.^{2}

H 25 in.^{2}

J 13 in.^{2}

GO ON

57 Which of the following equations best represents the relationship in the set of data shown below?

x	–4	–3	–1	2	4
y	24	17	9	12	24

A $y = -7x - 4$

B $y = \frac{3}{2}x^2$

C $y = -5x + 4$

D $y = x^2 + 8$

58 Jesse had a collection of baseball cards. He gave 10 cards to his little brother and equally divided the remaining cards among himself and 3 of his friends. He then had 15 cards. How many baseball cards did Jesse originally have in his collection?

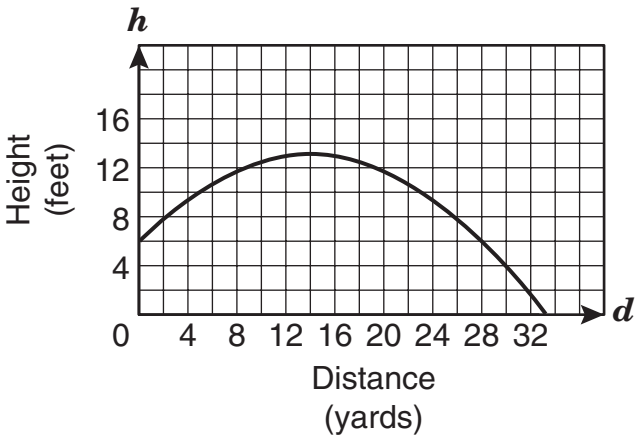
F 20

G 50

H 70

J 100

59 The graph represents the relationship between the height of a ball and the distance it traveled after the ball was thrown.



What conclusion can be drawn from the graph about this relationship?

A The ball reached a maximum height of about 16 feet after traveling a horizontal distance of approximately 33 yards.

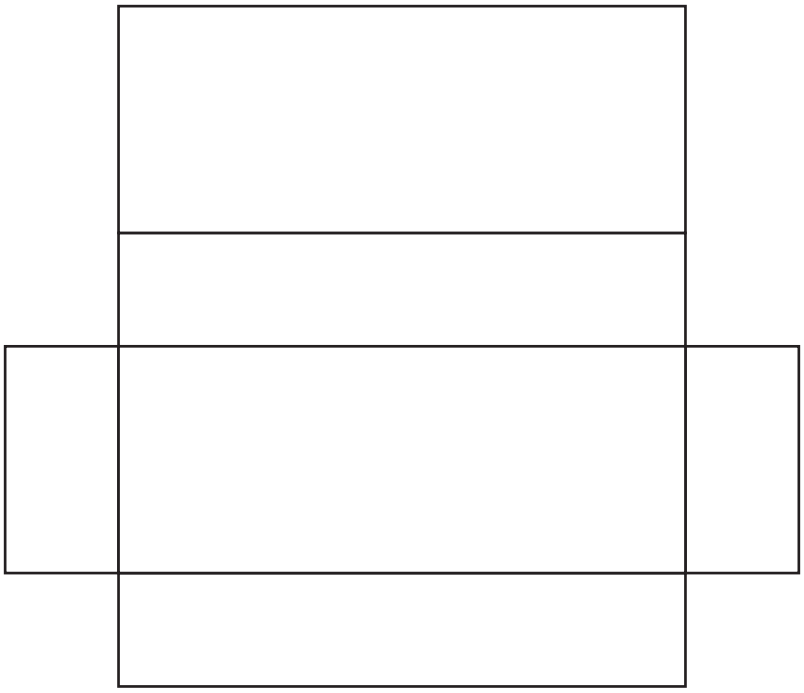
B The ball reached a maximum height of about 13 feet after traveling a horizontal distance of approximately 14 yards.

C The ball was thrown from a height of approximately 6 feet above the ground and traveled a horizontal distance of approximately 20 yards before it reached its maximum height.

D The ball was thrown from a height of approximately 7 feet above the ground and traveled a horizontal distance of approximately 10 yards before it reached its maximum height.

GO ON

60 Use the ruler on the Mathematics Chart to measure the dimensions of the net of the rectangular prism shown below to the nearest tenth of a centimeter.



Which of the following best represents the dimensions of the rectangular prism?

F 7.5 cm by 1.5 cm by 3.0 cm

G 10.5 cm by 1.5 cm by 9.0 cm

H 10.5 cm by 3.0 cm by 9.0 cm

J 7.5 cm by 3.0 cm by 3.0 cm

BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS ON THE ANSWER DOCUMENT.

STOP