2009 TEXAS TAKS TEST
Grade 10 – Math
Needed Correct to Pass: 33
Commended Performance: 51
Total Possible Score: 56

This file contains the Texas Assessment of Knowledge and Skills administered in Spring, 2009, along with the answer key, learning objectives, and, for writing tests, the scoring guide. This document is available to the public under Texas state law. This file was created from information released by the Texas Education Agency, which is the state agency that develops and administers the tests.

The number of correct answers required to "pass" this test is shown above. While it is supposedly around 70%, the exact number for each test is determined after the tests have been graded, and is often lower than 70%, making it possible to pass the test without learning some important areas of study. Because of this, I believe that making the passing grade should not be considered "good enough." A student's goal should be to master each of the objectives covered by the test. The "Commended Performance" score is a good goal for mastery of all the objectives.

The test in this file may differ somewhat in appearance from the printed version, due to formatting limitations. Since TAKS questions are changed each year, some proposed questions for future tests are included in each year's exams in order to evaluate the questions. Questions being evaluated for future tests do not count toward a student's score. Those questions are also not included in the version of the test made available to the public, until such time as they become part of the official test.

Questions and comments about the tests should be directed to:

Texas Education Agency
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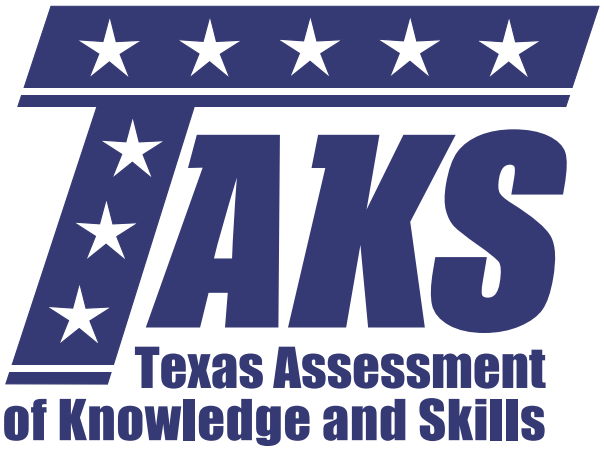
Austin, Texas 78701
phone: 512-463-9536
email: Student.Assessment@tea.state.tx.us

For comments and questions about this file or the web site, you can e-mail me at scott@scotthochberg.com, or write to me at the address below. Please include your full name and home address. To download additional tests, go to www.scotthochberg.com. All costs for posting this material on this web site have been paid for by the Scott Hochberg Campaign 6000 Reims #2605 Houston, TX 77036. No tax dollars were used for these purposes.

STUDENT NAME _____



GRADE 10
MATHEMATICS

Administered April 2009

MATHEMATICS

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 fluid ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 fluid 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 $A = \frac{(b_1 + b_2)h}{2}$
	regular polygon	$A = \frac{1}{2}aP$
	circle	$A = \pi r^2$
P represents the Perimeter of the Base of a three-dimensional figure.		
B represents the Area of the Base of a three-dimensional figure.		
Surface Area	cube (total)	$S = 6s^2$
	prism (lateral)	$S = Ph$
	prism (total)	$S = Ph + 2B$
	pyramid (lateral)	$S = \frac{1}{2}Pl$
	pyramid (total)	$S = \frac{1}{2}Pl + B$
	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	$V = \frac{4}{3}\pi r^3$
Special Right Triangles	30°, 60°, 90°	$x,\ x\sqrt{3},\ 2x$
	45°, 45°, 90°	$x,\ x,\ x\sqrt{2}$
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

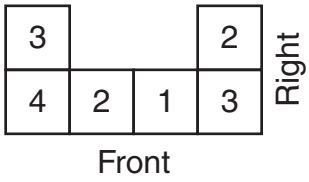
D Not here

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?

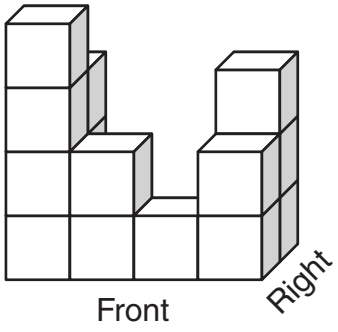
Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

1 The grid below shows the top view of a 3-dimensional structure built using identical cubes. The numbers represent how many cubes are in each column.

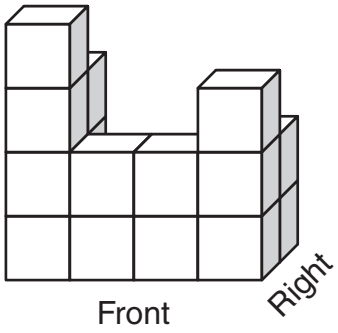


Which of the following best represents this structure?

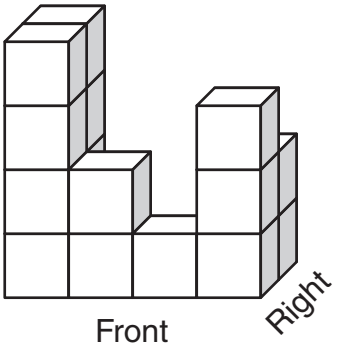
A



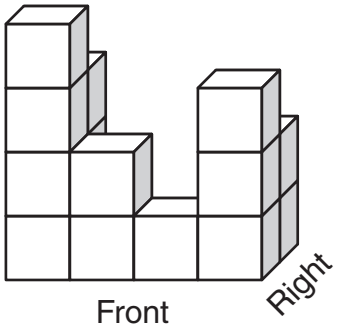
C



B



D



GO ON

2 Wesley works at a shoe store. He is paid $8 an hour plus a 7% commission on his total sales. Which of the following best represents t, Wesley's total weekly earnings if he works 30 hours and has total sales of s dollars?

F $t = 0.08(30) + 0.07s$

G $t = 8(30) + 7s$

H $t = 8(30) + 0.07s$

J $t = 8(30) + 0.7s$

3 A toy company plans to make a model of a train engine using a scale where 1 inch represents 4 feet. If the length of the actual engine is 51 feet, which of these is closest to the length of the model in inches?

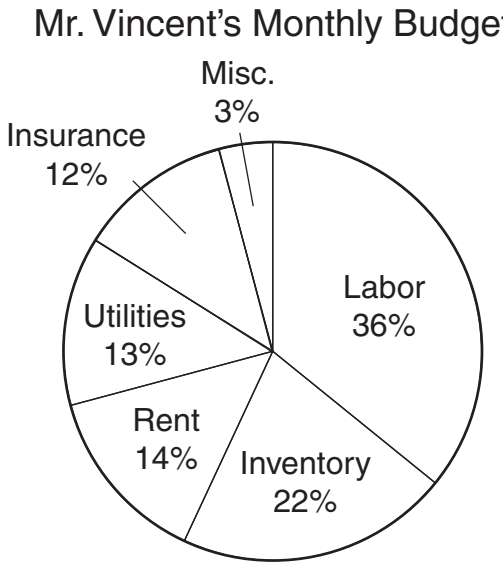
A $12\frac{3}{4}$ in.

B 3 in.

C 204 in.

D $11\frac{1}{3}$ in.

4 Mr. Vincent owns a store that sells auto parts. He budgeted $24,000 for the store's expenses last month. The graph below shows the percentage of the budget he reserved for each type of expense.



Which statement is best supported by the data in the graph?

F Mr. Vincent budgeted $15,500 for labor, utilities, and rent.

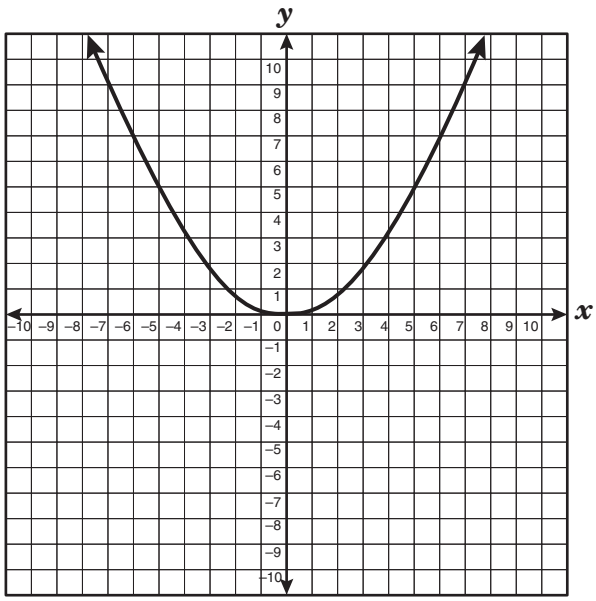
G More than 50% of Mr. Vincent's budget was reserved for rent and utilities.

H Mr. Vincent budgeted $16,800 for labor, insurance, and inventory.

J Less than 50% of Mr. Vincent's budget was reserved for labor and inventory.

GO ON

5 The graph of $y = 0.2x^2$ is shown below.



Which of the following equations represents a graph that is wider than the graph of $y = 0.2x^2$?

A $y = 0.3x^2$

B $y = 0.2x^2 + 1$

C $y = 0.1x^2$

D $y = 0.2x^2 - 1$

6 Which expression is equivalent to $5[4 + 3(x - 6)]$?

F $15x - 10$

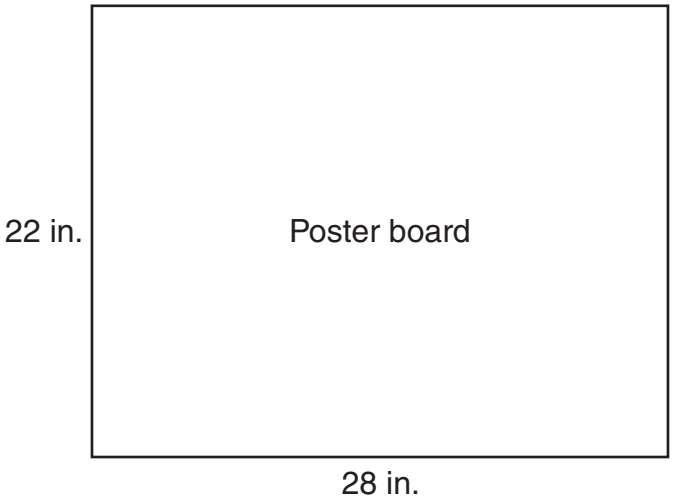
G $15x - 70$

H $15x - 14$

J $15x - 110$

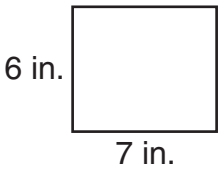
GO ON

7 The dimensions of a rectangular poster board are shown below.

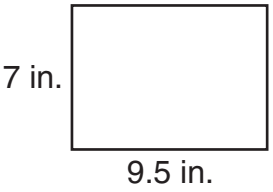


Which rectangle can be dilated to fit the exact dimensions of this poster board?

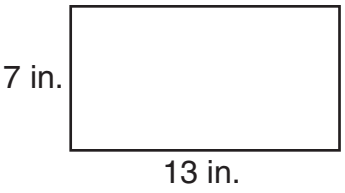
A



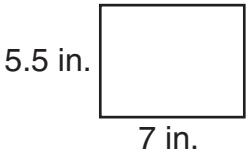
B



C

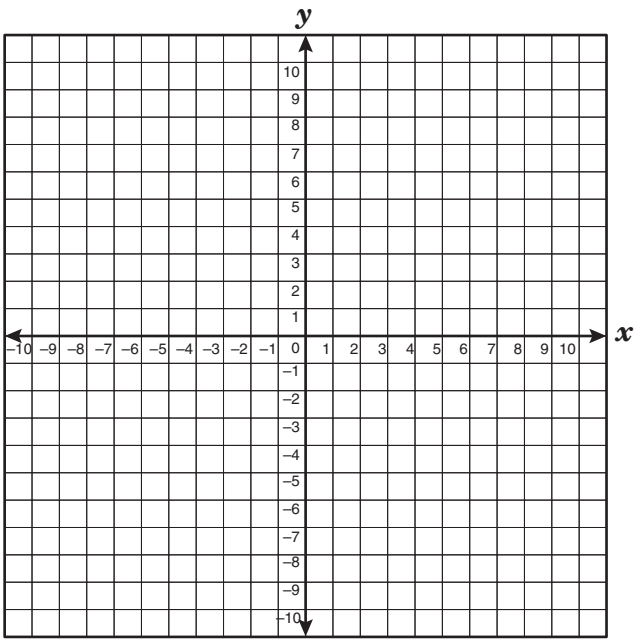


D



GO ON

8 What is the equation of the line that passes through the point (9, 2) and has a y-intercept of (0, 5)?



F $y = \frac{1}{3}x + 5$

G $y = 2x + 5$

H $y = -\frac{1}{3}x + 5$

J $y = 5x + 9$

9 Jeri can row a boat at a speed of 8 miles per hour with the current. The number of miles, m, she rows with the current in h hours can be represented by the function $m = 8h$. Which of the following represents the dependent quantity in this function?

A The weight of Jeri's boat

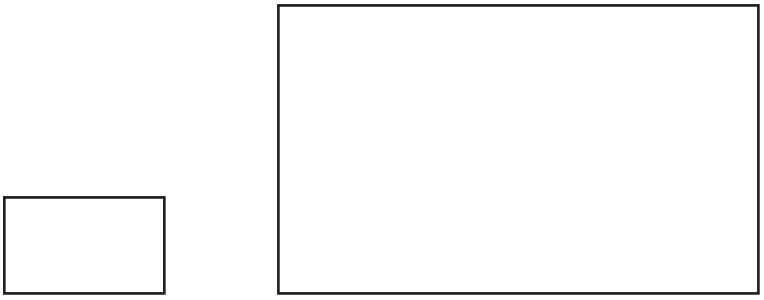
B The speed of the current

C The amount of time Jeri rows

D The number of miles Jeri rows

GO ON

10 The two rectangles shown below are similar. The ratio of the length of the larger rectangle to the length of the smaller rectangle is 3:1.



Which of the following statements is true?

F The area of the smaller rectangle is $\frac{1}{4}$ the area of the larger rectangle.

G The area of the larger rectangle is 3 times the area of the smaller rectangle.

H The perimeter of the smaller rectangle is $\frac{1}{3}$ the perimeter of the larger rectangle.

J The perimeter of the larger rectangle is 6 times the perimeter of the smaller rectangle.

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11 Jason had \$87 in his savings account. He then worked for 2 weeks, earning \$5.75 per hour, and deposited all the money he earned into his savings account. The account then had a balance of \$271. Which method can be used to find the number of hours Jason worked?

A Subtract 87 from 271 and then divide the difference by 5.75

B Subtract 87 from 271 and then multiply the difference by 5.75

C Add 87 to 271 and then divide the sum by 5.75

D Add 87 to 271 and then multiply the sum by 5.75

GO ON

12 The tables below show the amount of data in kilobytes that was downloaded by a computer over time. Which of the following tables best represents a linear function?

F

Kilobytes Downloaded

Time (seconds)	Number of Kilobytes
10	65
20	130
30	180
40	215

H

Kilobytes Downloaded

Time (seconds)	Number of Kilobytes
10	35
20	80
30	125
40	150

G

Kilobytes Downloaded

Time (seconds)	Number of Kilobytes
10	40
20	80
30	110
40	140

J

Kilobytes Downloaded

Time (seconds)	Number of Kilobytes
10	45
20	90
30	135
40	180

13 ΔLPT is an obtuse scalene triangle. If $\angle P$ is the obtuse angle in ΔLPT, which of the following is not a valid conclusion?

A $m\angle L + m\angle T < m\angle P$

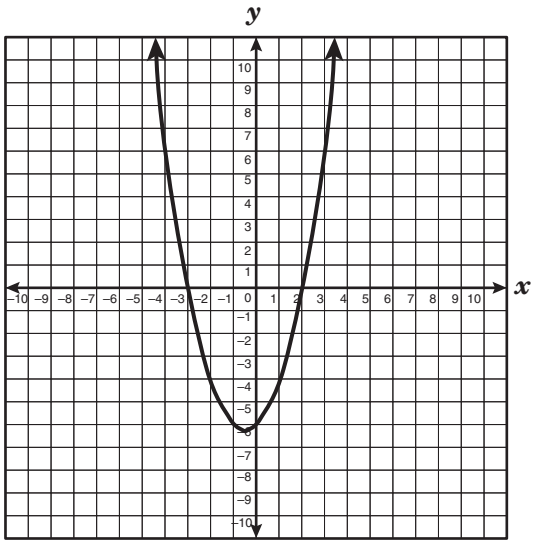
B $m\angle P + m\angle T < 90°$

C $m\angle L + m\angle T < 90°$

D $m\angle L + m\angle P + m\angle T = 180°$

GO ON

14 The graph of $f(x) = x^2 + x - 6$ is shown below.



Which of the following is a zero of this function?

F -6

G 3

H -2

J 2

15 Sabrina has a bag of 5 marbles that are identical in size. The bag contains 4 blue marbles and 1 red marble. If Sabrina randomly draws a marble from the bag, replaces it, and then draws another marble, what is the probability that she will first draw a blue marble and then a red marble?

A $\frac{4}{25}$

B $\frac{1}{5}$

C $\frac{4}{5}$

D $\frac{1}{4}$

16 The length of a rectangular garden is 20 feet longer than the width, w. Which equation best describes the garden's perimeter, P?

F $P = (w + 20) + w$

G $P = (w + 20)w$

H $P = (w + 20)2w$

J $P = 2(w + 20) + 2w$

GO ON

17 At a pet store the total cost of 8 pounds of Brand X dog food and 1 pound of Brand Y dog food is $8.40, including tax. The total cost of 16 pounds of Brand X dog food and 8 pounds of Brand Y dog food is $24.00, including tax. What is the price per pound of Brand Y dog food?

A $0.90

B $1.20

C $2.60

D $4.08

18 At an automobile dealership, 2 out of every 12 cars sold are red. Which is the best prediction of the number of red cars sold when the automobile dealer sells 150 cars?

F 75

G 25

H 15

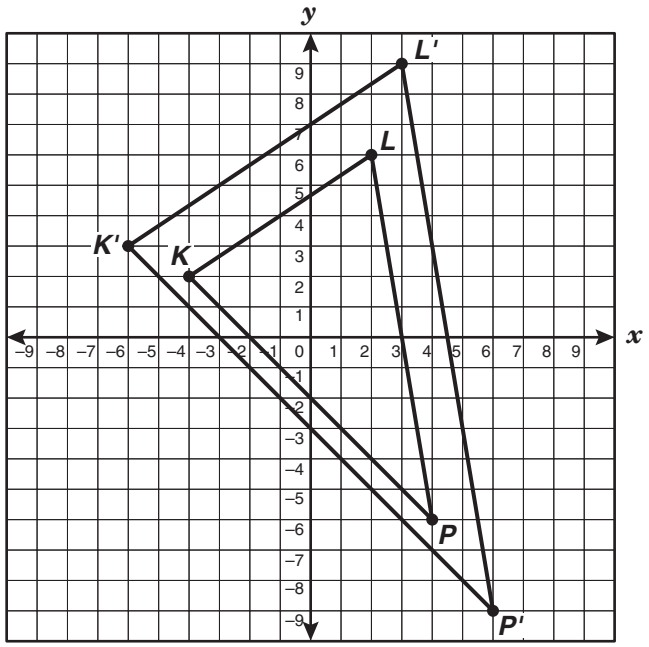
J 12

19 Mr. García built a rectangular deck in his backyard. The deck was 16 feet long and 12 feet wide. What was the length, in feet, of the diagonal of the rectangular deck?

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

GO ON

20 ΔKLP has vertices $K\,(-4, 2)$, $L\,(2, 6)$, and $P\,(4, -6)$. It is dilated to form $\Delta K'L'P'$ with the origin as the center of dilation.



If the coordinates of K' are $(-6, 3)$, what scale factor was used to form $\Delta K'L'P'$?

F $\frac{2}{3}$

G $\frac{1}{4}$

H $\frac{3}{2}$

J 4

GO ON

21 If the area of a circle is 95 square inches, which of the following is closest to the circumference of this circle?

A 17 in.

B 35 in.

C 19 in.

D 190 in.

22 The formula below can be used to convert temperatures in degrees Fahrenheit, F, to temperatures in degrees Celsius, C.

$$C = \frac{5}{9}(F - 32)$$

On a certain day temperatures at the North Pole were between $-20°$F and $-15°$F. Which of these is a reasonable temperature in degrees Celsius for that day at the North Pole?

F $-30°$C

G $-22°$C

H $-27°$C

J $-11°$C

GO ON

23 To buy a membership at a recreation center, people must pay a one-time registration fee plus a regular monthly fee. The table below shows the total amount a person pays, including the registration fee, for different numbers of months of membership.

Membership Fees

Number of Months	Total Amount Paid
4	$150
6	$200
12	$350
24	$650

According to the information in the table, which of the following statements is true?

A The monthly fee is $50.

B The monthly fee is $37.50.

C The registration fee is $75.

D The registration fee is $50.

24 A math club is planning to sell candles to pay for the cost of attending the regional math competition. The club needs to raise a total of $250. The candles come in boxes of 24. What additional information is needed to determine the number of candles the club needs to sell?

F The colors of the candles

G The profit the club will make on each candle sold

H The number of boxes ordered

J The number of students in the math club

GO ON

25 Which statement best describes how the volume of a cube changes when the edge length is doubled to form a new cube?

A The volume of the new cube is $\frac{1}{2}$ the volume of the original cube.

B The volume of the new cube is $\frac{1}{4}$ the volume of the original cube.

C The volume of the new cube is 8 times the volume of the original cube.

D The volume of the new cube is 4 times the volume of the original cube.

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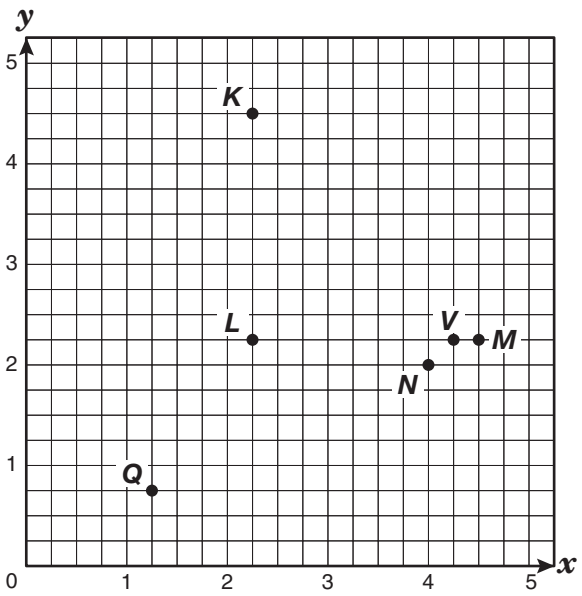
26 Which point on the grid below best represents the coordinate point $(\frac{9}{2}, \frac{9}{4})$?



F Point Q

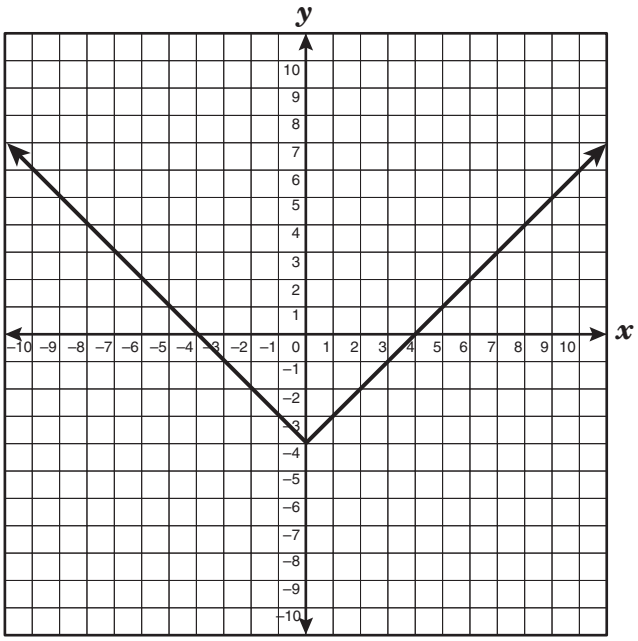
G Point M

H Point V

J Point K

GO ON

27 Which of the following best represents the range of the function shown below?



A The range is all real numbers.

B The range is all real numbers greater than or equal to 4.

C The range is all real numbers greater than or equal to zero.

D The range is all real numbers greater than or equal to -4.

28 A spherical ball has a diameter of 10 centimeters. Which is closest to the volume of the ball?

F 524 cm^3

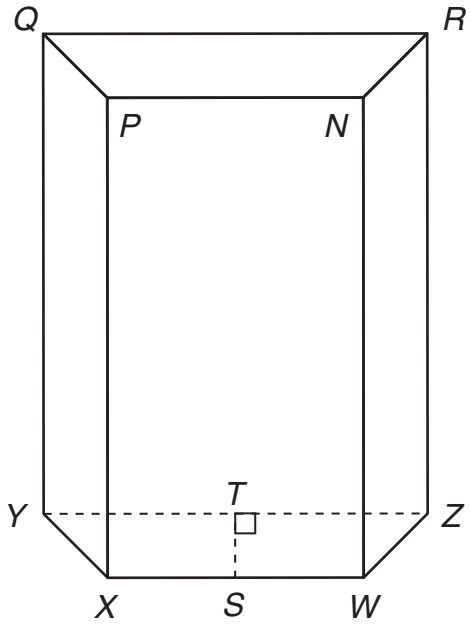
G 393 cm^3

H 4189 cm^3

J 105 cm^3

GO ON

29 In the trapezoidal prism shown below, $NP = 8$ centimeters, and $QR = 12$ centimeters. The height of the prism is 15 centimeters.



Which additional information can be used to determine the volume of the prism?

A The area of rectangle $PXWN$

B The area of rectangle $QYZR$

C The length of $\overline{NR}$

D The length of $\overline{TS}$

30 Lorraine wants to paint the 4 rectangular walls of a room, including the door. The room is 18 feet long and 12 feet wide, and the walls are 10 feet high. What is the total area that will be painted?

F $300\ \text{ft}^2$

G $600\ \text{ft}^2$

H $816\ \text{ft}^2$

J $864\ \text{ft}^2$

31 Which of the following represents the parent function of $y = x^2 - 2x - 15$?

A $y = x$

B $y = x^2 - 15$

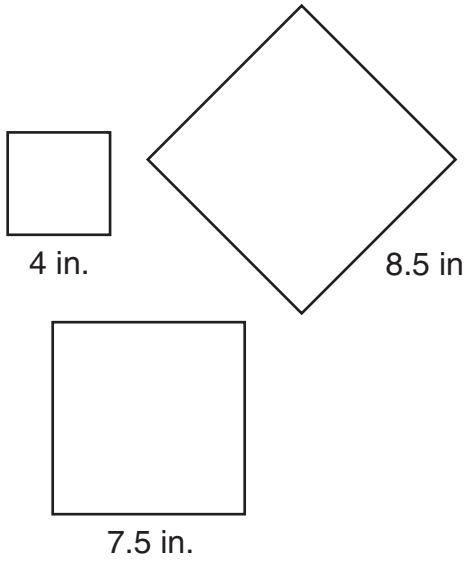
C $y = x^2$

D $y = -2x$

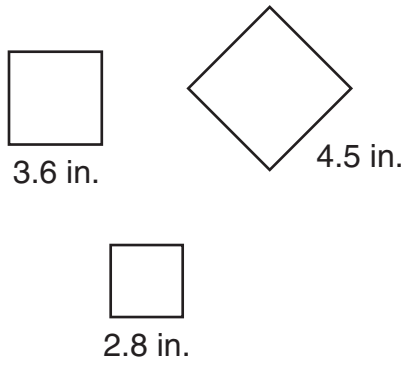
GO ON

32 Which group of squares can be joined at their vertices to form a right triangle?

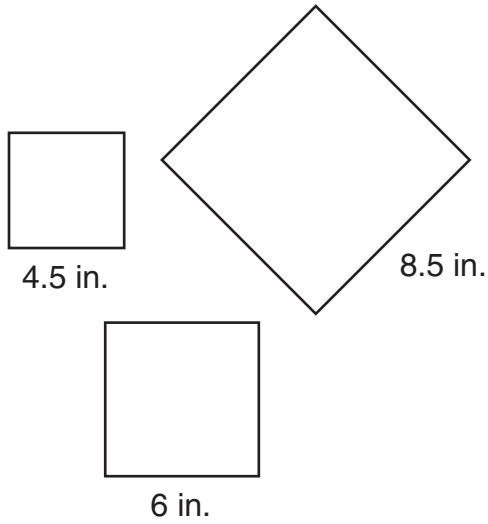
F



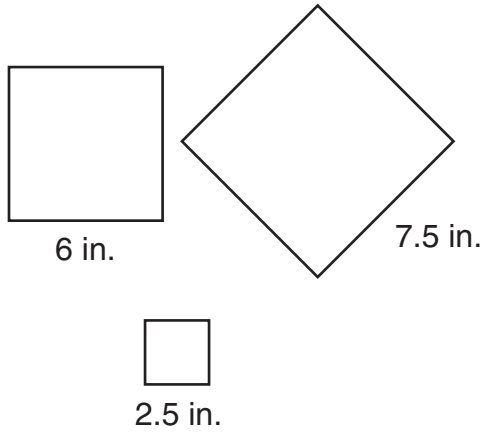
H



G



J



33 Ms. Lee is planning to travel a total of 1250 miles during a trip. Her car gets 30 miles per gallon on the highway and 22 miles per gallon in the city. If Ms. Lee plans to travel 1000 miles of her trip on the highway, which of these is closest to the total number of gallons of gasoline she will need for the entire trip?

A 38 gallons

B 33 gallons

C 45 gallons

D 48 gallons

34 What is the slope of the graph of the equation $3x + 2y = 6$?

F $\frac{2}{3}$

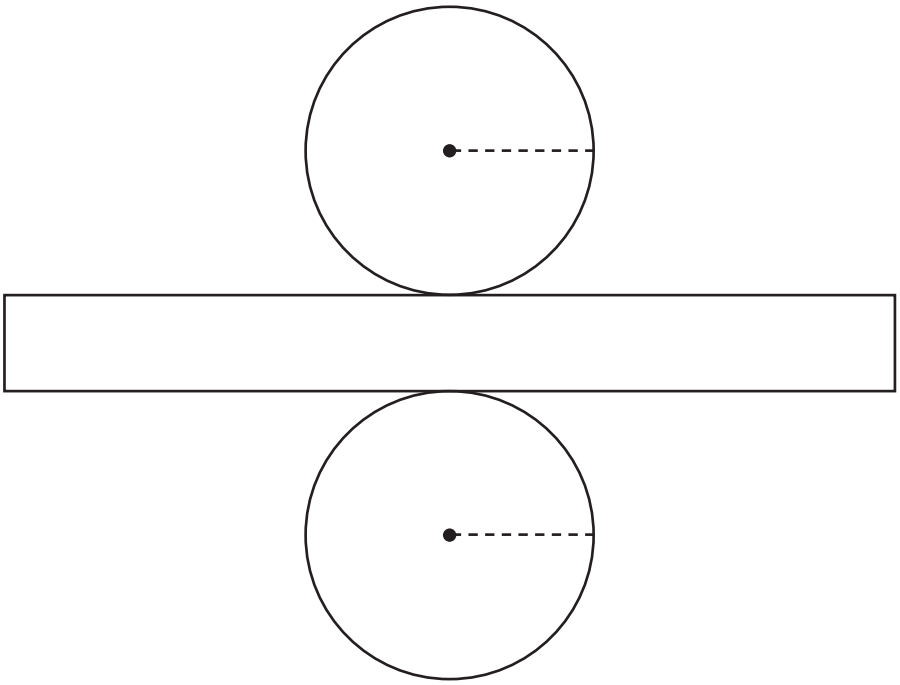
G $-\frac{3}{2}$

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

J $\frac{3}{2}$

GO ON

35 The net of a cylinder is shown below. Use the ruler on the Mathematics Chart to measure the dimensions of the net to the nearest $\frac{1}{4}$ inch.



Which of these is closest to the total surface area of the cylinder?

A 4 in.^{2}

B 2.5 in.^{2}

C 6 in.^{2}

D 1.8 in.^{2}

36 If $c = -5$, how does the graph of $y = x^2 + 2c$ compare to the graph of $y = x^2 + c$?

F The graph of $y = x^2 + 2c$ is below the graph of $y = x^2 + c$.

G The graph of $y = x^2 + 2c$ is above the graph of $y = x^2 + c$.

H The graph of $y = x^2 + 2c$ is narrower than the graph of $y = x^2 + c$.

J The graph of $y = x^2 + 2c$ is wider than the graph of $y = x^2 + c$.

GO ON

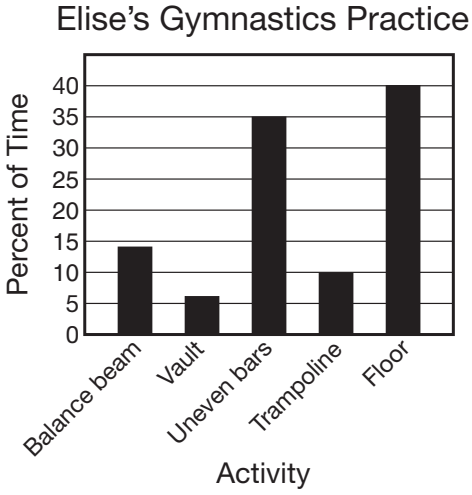
37 Elise practiced gymnastics for 50 minutes. The time she spent on each activity is recorded in the table below.

Elise's Gymnastics Practice

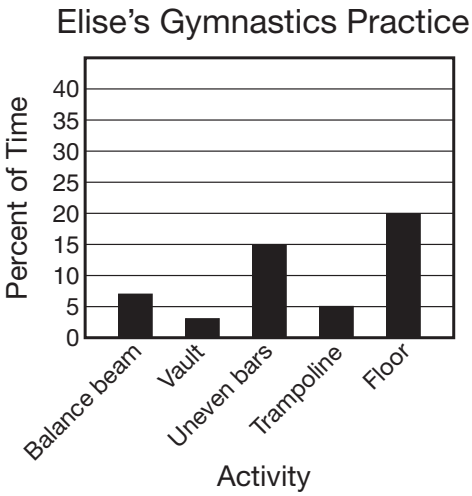
Activity	Time Spent (minutes)
Balance beam	7
Vault	3
Uneven bars	15
Trampoline	5
Floor	20

Which of the following graphs best represents the percent of time Elise spent on each activity during her gymnastics practice?

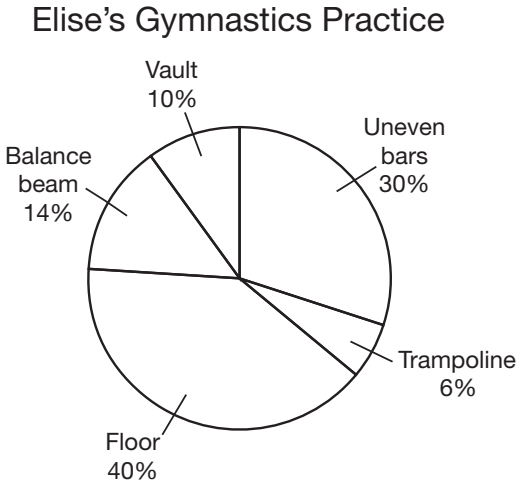
A



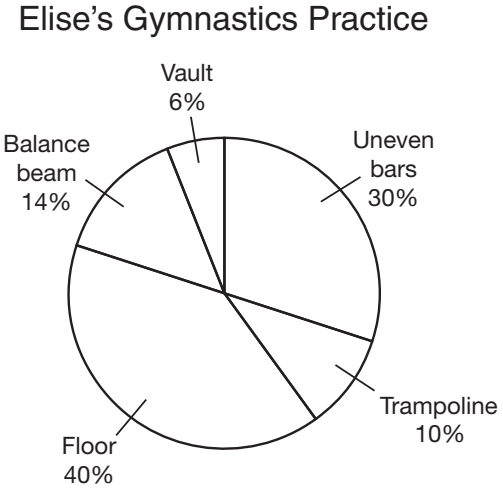
C



B



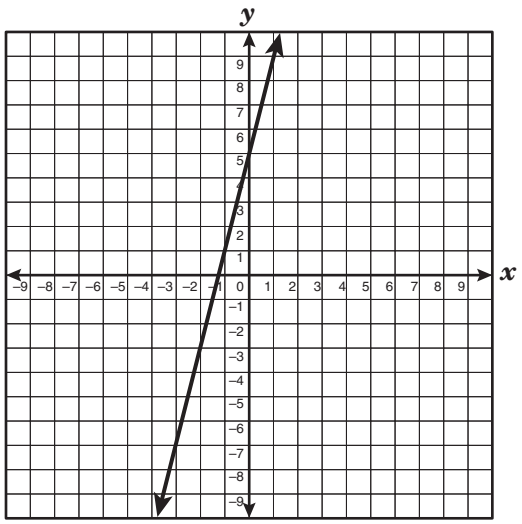
D



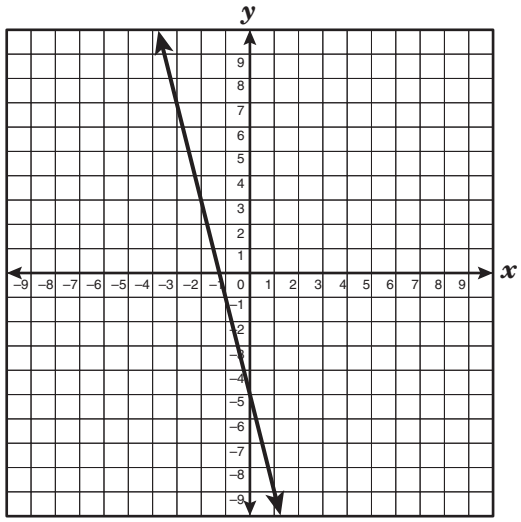
GO ON

38 Which of the following best represents the graph of the equation $4x - y = -5$?

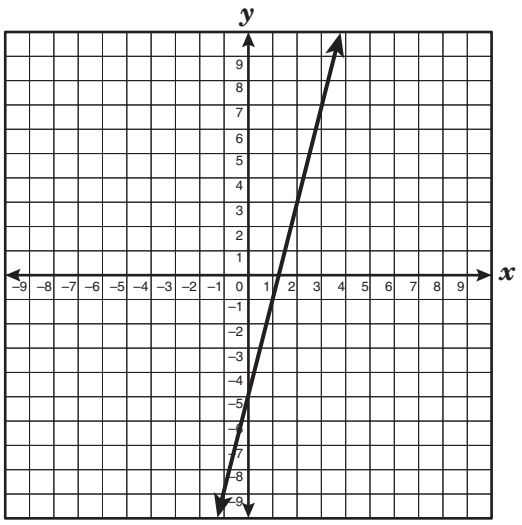
F



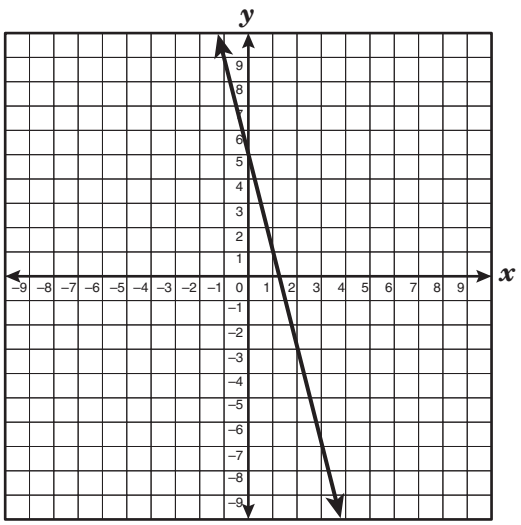
H



G



J



39 Jasmine bought an alarm clock that was on sale for 25% off the regular price of \$24.99. She paid an 8% sales tax on the sale price. Which of the following is closest to the amount Jasmine paid for the alarm clock, including sales tax?

A \$18.74

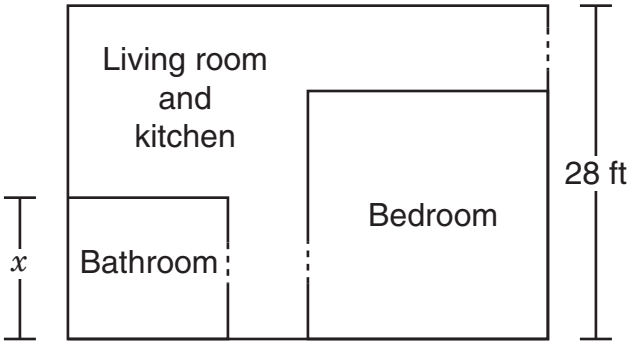
B \$22.99

C \$17.24

D \$20.24

GO ON

40 The diagram below shows the floor plan of an apartment with a rectangular floor. The ratio of the width of the bathroom floor to the width of the entire apartment floor is 3:7.



What is x, the width of the bathroom in inches?

F 112 in.

G 40 in.

H 144 in.

J 48 in.

41 The area, A, of a parallelogram is $64x^9y^6$ square feet. The height, h, of the parallelogram is $16x^3y^2$ feet. The area of a parallelogram can be found by using the formula $A = bh$. Which of the following best represents the length of this parallelogram's base, b?

A $4x^6y^4$ ft

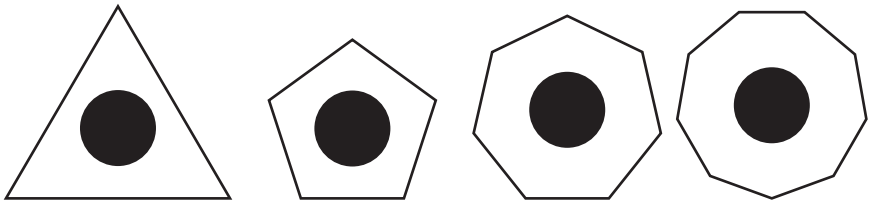
B $80x^{12}y^8$ ft

C $4x^3y^3$ ft

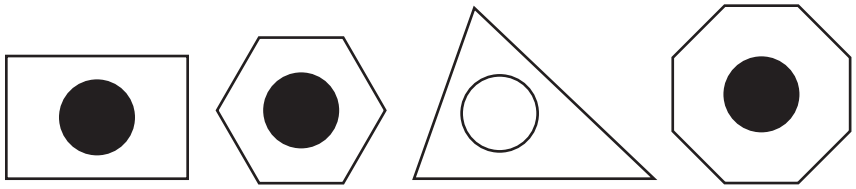
D $48x^6y^4$ ft

GO ON

42 The following figures are examples of *skeys*.

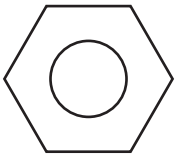


The following figures are not examples of *skeys*.



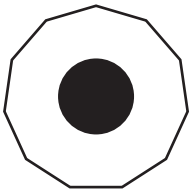
According to this information, which of the following figures best represents a *skey*?

F



H

G



J

43 For what value of x is $(x, -3)$ a solution for $4x - 3y = 21$?

A 11

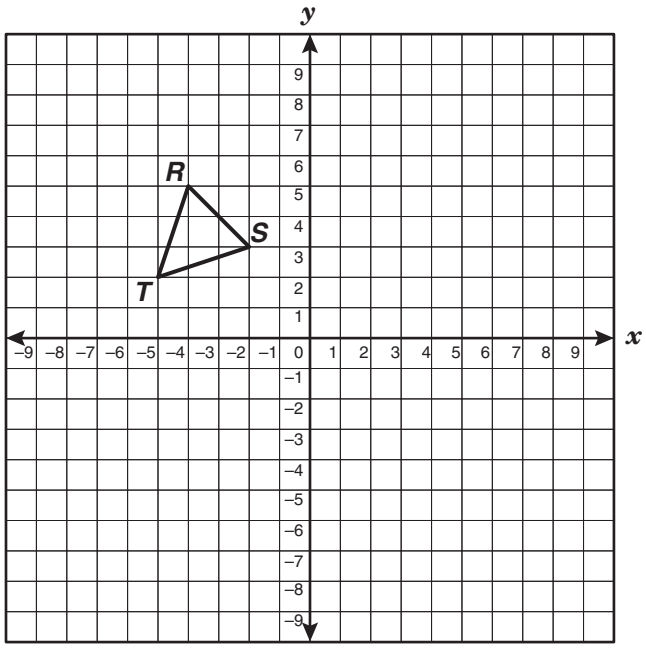
B -3

C -11

D 3

GO ON

44 ΔRST has the vertices $R\ (-4, 5)$, $S\ (-2, 3)$, and $T\ (-5, 2)$.



If ΔRST is reflected across the x-axis and then translated 2 units down to become $\Delta R'S'T'$, what will be the coordinates of S'?

F $(2, 1)$

G $(-2, -5)$

H $(-5, -2)$

J $(-2, -1)$

GO ON

45 Mandy bought a bag of peanuts to share with her friends.

- Trisha received $\frac{1}{2}$ of the peanuts in the bag.
- Vince received $\frac{1}{4}$ of the peanuts Trisha received.
- Ray received $\frac{1}{3}$ of the peanuts Vince received.

If Ray received 4 peanuts, how many peanuts were in the bag Mandy bought?

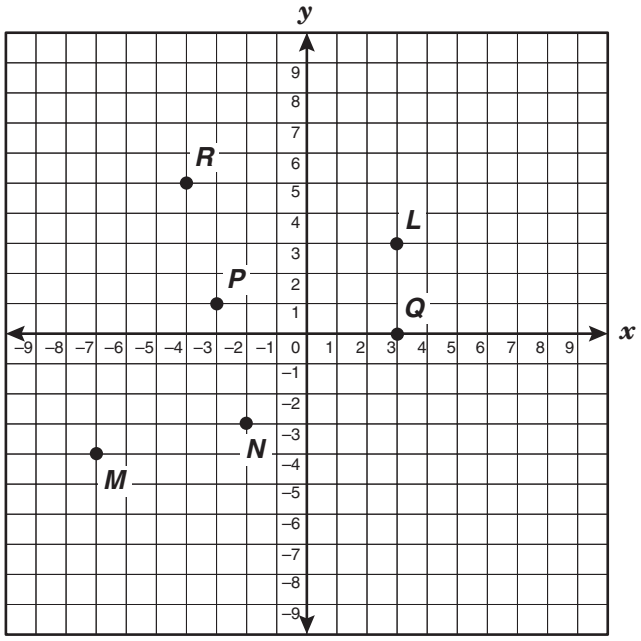
A 13

B 32

C 96

D Not here

46 Which point on the grid satisfies the conditions $x \geq -3$ and $y \leq -1$?



F Point N

G Point P

H Point M

J Point L

47 Wanda wants to buy some picture frames for her home. Small picture frames cost \$8 each, and large picture frames cost \$12 each. If Wanda wants to spend less than \$100 on picture frames, which of the following inequalities can be used to determine the number of small frames, s, and the number of large frames, l, she can buy?

A $12s + 8l < 100$

B $8s + 12l < 100$

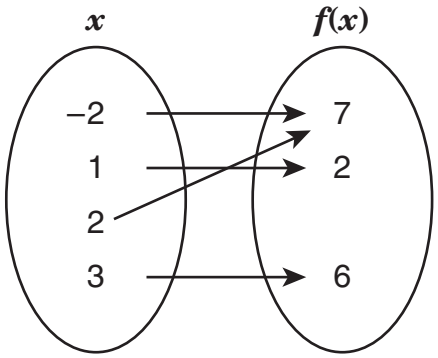
C $12s + 8l > 100$

D $8s + 12l > 100$

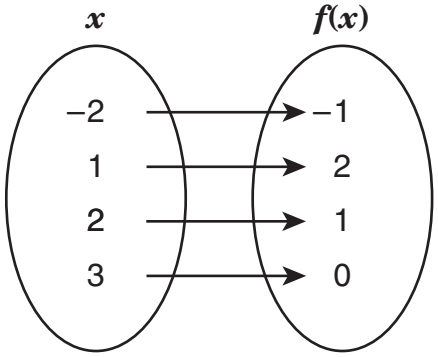
GO ON

48 Which of the following mappings best represents the function $f(x) = -x^2 + 3$?

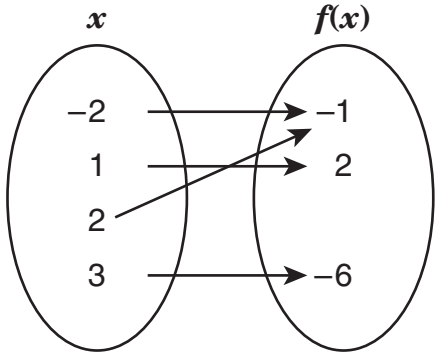
F



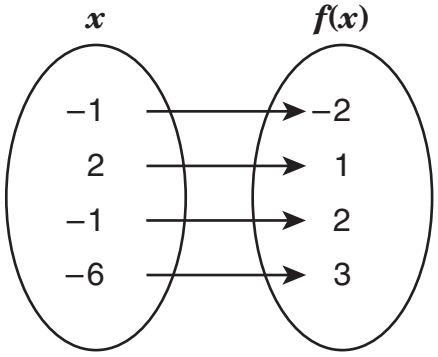
G



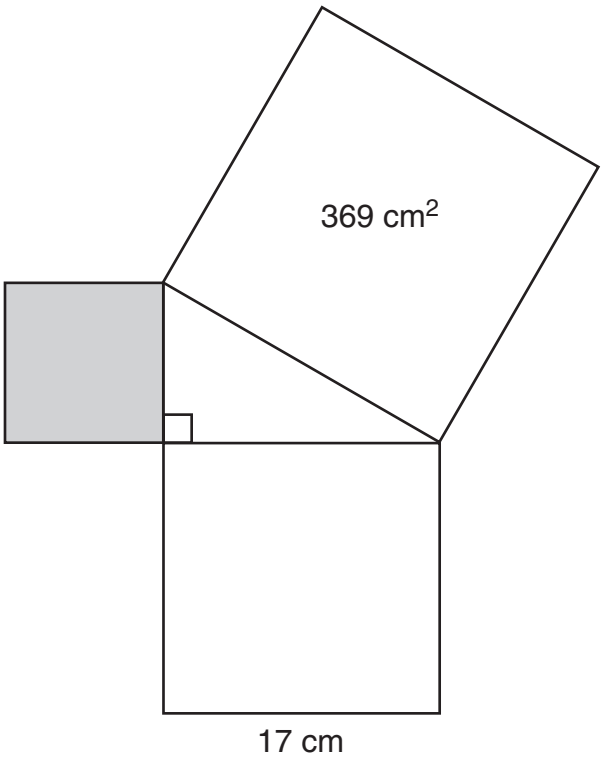
H



J



49 The three squares shown below are joined at their vertices to form a right triangle.



What is the area of the shaded square?

A 80 cm^2

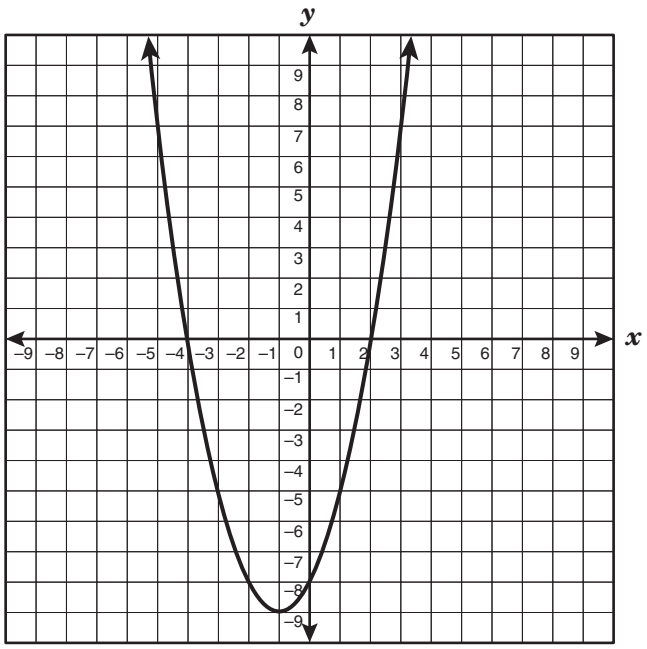
B 352 cm^2

C 2 cm^2

D 658 cm^2

GO ON

50 The graph of $y = x^2 + 2x - 8$ is shown below.



Which coordinate pair best represents the vertex of this graph?

F $(-4, 0)$

G $(2, 0)$

H $(0, -8)$

J $(-1, -9)$

51 Two complementary angles have measures of s and t. If t is 9 less than twice s, which system of linear equations can be used to determine the measure of each angle?

A $t + s = -9$
$t = 2s + 90$

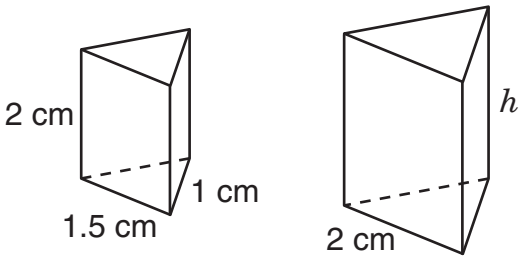
B $t - s = -9$
$t = 2s - 90$

C $t + s = 90$
$t = 2s - 9$

D $t + s = 90$
$t = -2s - 9$

GO ON

52 The two triangular prisms shown below are similar.



Which of these is closest to h, the height of the larger prism?

F 1.3 cm

G 2.7 cm

H 7 cm

J 1 cm

53 A company rented a copy machine for \$225 per month for 3 months. The company also paid \$0.012 for each copy made. If the total cost of using the copy machine during this 3-month period was \$1,107, how many copies did the company make?

A 148,500

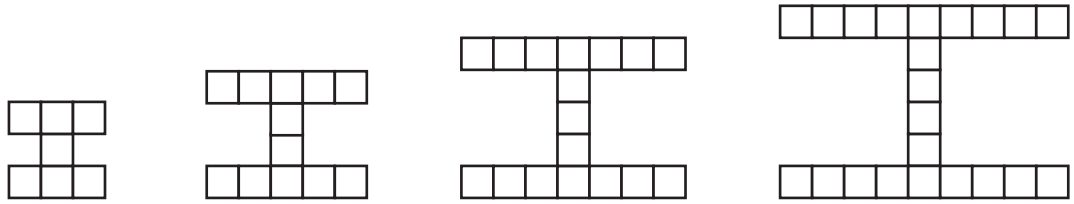
B 92,250

C 73,500

D 36,000

GO ON

54 The square tiles below are arranged to show a pattern.



Which expression can be used to determine the number of square tiles in Stage n?

F $4n + 3$

G $5n + 2$

H $n^2 + 6$

J $n^3 + 6$

55 The table below shows the relationship between x and $f(x)$.

x	$f(x)$
−2	4
−1	2
0	0
1	−2
2	−4

Which function represents this relationship?

A $f(x) = 2x$

B $f(x) = -2x$

C $f(x) = -x - 2$

D $f(x) = x + 6$

56 If y is directly proportional to x and $y = 8$ when $x = 10$, what is the value of y when $x = 5$?

F 4

G 16

H 40

J 80

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

STOP

TAKS GRADE 10
MATHEMATICS
APRIL 2009

Texas Assessment of Knowledge and Skills - Answer Key

Grade: 10
Subject: Mathematics
Administration: April 2009

The letter **A** indicates that the student expectation listed is from the Algebra I TEKS.

Item Number	Correct Answer	Objective Measured	Student Expectations
01	D	07	8.7 (A)
02	H	01	A.1 (C)
03	A	07	8.7 (B)
04	H	09	8.13 (B)
05	C	05	A.9 (B)
06	G	02	A.4 (B)
07	D	06	8.6 (A)
08	H	03	A.6 (D)
09	D	01	A.1 (A)
10	H	08	8.10 (A)
11	A	10	8.14 (C)
12	J	03	A.5 (A)
13	B	10	8.16 (B)
14	J	05	A.10 (B)
15	A	09	8.11 (A)
16	J	02	A.3 (A)
17	B	04	A.8 (B)
18	G	09	8.11 (B)
19	20.	08	8.9 (A)
20	H	06	8.6 (A)
21	B	10	8.14 (B)
22	H	04	A.7 (C)
23	D	01	A.1 (E)
24	G	10	8.14 (A)
25	C	08	8.10 (B)
26	G	06	8.7 (D)
27	D	02	A.2 (B)
28	F	08	8.8 (C)
29	D	10	8.15 (A)
30	G	08	8.8 (C)
31	C	02	A.2 (A)
32	F	07	8.7 (C)
33	C	10	8.14 (A)
34	G	03	A.6 (A)
35	C	08	8.8 (A)
36	F	05	A.9 (C)
37	D	09	8.12 (C)
38	F	03	A.5 (C)
39	D	09	8.3 (B)
40	H	07	8.7 (B)
41	A	05	A.11 (A)
42	G	10	8.16 (A)
43	D	04	A.7 (B)
44	G	06	8.6 (B)
45	C	10	8.14 (C)
46	F	06	8.7 (D)
47	B	04	A.7 (A)
48	H	01	A.1 (D)
49	A	07	8.7 (C)
50	J	05	A.9 (D)
51	C	04	A.8 (A)
52	G	08	8.9 (B)
53	D	10	8.14 (B)
54	G	02	A.3 (B)
55	B	01	A.1 (B)
56	F	03	A.6 (G)

Grade 10 Mathematics

For a more complete description of the objectives measured, please refer to the Revised TAKS Information Booklet for Grade 10 Mathematics at http://www.tea.state.tx.us/student.assessment/taks/booklets/index.html.

Objective 1: The student will describe functional relationships in a variety of ways.

(A.1) **Foundations for functions.** The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to

(A) describe independent and dependent quantities in functional relationships;

(B) [gather and record data and] use data sets to determine functional relationships between quantities;

(C) describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations;

(D) represent relationships among quantities using [concrete] models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities; and

(E) interpret and make decisions, predictions, and critical judgments from functional relationships.

Objective 2: The student will demonstrate an understanding of the properties and attributes of functions.

(A.2) **Foundations for functions.** The student uses the properties and attributes of functions. The student is expected to

(A) identify [and sketch] the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions;

(B) identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete;

(C) interpret situations in terms of given graphs [or create situations that fit given graphs]; and

(D) [collect and] organize data, [make and] interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.

(A.3) **Foundations for functions.** The student understands how algebra can be used to express generalizations and recognizes and uses the power of symbols to represent situations. The student is expected to

(A) use symbols to represent unknowns and variables; and

(B) look for patterns and represent generalizations algebraically.

(A.4) **Foundations for functions.** The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to

(A) find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations;

(B) use the commutative, associative, and distributive properties to simplify algebraic expressions; and

(C) connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$.

Objective 3: The student will demonstrate an understanding of linear functions.

(A.5) **Linear functions.** The student understands that linear functions can be represented in different ways and translates among their various representations. The student is expected to

(A) determine whether or not given situations can be represented by linear functions; and

(C) use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.

(A.6) **Linear functions.** The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to

(A) develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations;

(B) interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs;

(C) investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$;

(D) graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y-intercept;

(E) determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations;

(F) interpret and predict the effects of changing slope and y-intercept in applied situations; and

(G) relate direct variation to linear functions and solve problems involving proportional change.

Objective 4: The student will formulate and use linear equations and inequalities.

(A.7) **Linear functions.** The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to

(A) analyze situations involving linear functions and formulate linear equations or inequalities to solve problems;

(B) investigate methods for solving linear equations and inequalities using [concrete] models, graphs, and the properties of equality, select a method, and solve the equations and inequalities; and

(C) interpret and determine the reasonableness of solutions to linear equations and inequalities.

(A.8) **Linear functions.** The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to

(A) analyze situations and formulate systems of linear equations in two unknowns to solve problems;

(B) solve systems of linear equations using [concrete] models, graphs, tables, and algebraic methods; and

(C) interpret and determine the reasonableness of solutions to systems of linear equations.

Objective 5: The student will demonstrate an understanding of quadratic and other nonlinear functions.

(A.9) **Quadratic and other nonlinear functions.** The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to

(B) investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$;

(C) investigate, describe, and predict the effects of changes in c on the graph of $y = ax^2 + c$; and

(D) analyze graphs of quadratic functions and draw conclusions.

(A.10) **Quadratic and other nonlinear functions.** The student understands there is more than one way to solve a quadratic equation and solves them using appropriate methods. The student is expected to

(A) solve quadratic equations using [concrete] models, tables, graphs, and algebraic methods; and

(B) make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function.

(A.11) **Quadratic and other nonlinear functions.** The student understands there are situations modeled by functions that are neither linear nor quadratic and models the situations. The student is expected to

(A) use [patterns to generate] the laws of exponents and apply them in problem-solving situations.

Objective 6: The student will demonstrate an understanding of geometric relationships and spatial reasoning.

(8.6) **Geometry and spatial reasoning.** The student uses transformational geometry to develop spatial sense. The student is expected to

(A) generate similar figures using dilations including enlargements and reductions; and

(B) graph dilations, reflections, and translations on a coordinate plane.

(8.7) **Geometry and spatial reasoning.** The student uses geometry to model and describe the physical world. The student is expected to

(D) locate and name points on a coordinate plane using ordered pairs of rational numbers.

Objective 7: The student will demonstrate an understanding of two- and three-dimensional representations of geometric relationships and shapes.

(8.7) **Geometry and spatial reasoning.** The student uses geometry to model and describe the physical world. The student is expected to

(A) draw three-dimensional figures from different perspectives;

(B) use geometric concepts and properties to solve problems in fields such as art and architecture; and

(C) use pictures or models to demonstrate the Pythagorean Theorem.

Objective 8: The student will demonstrate an understanding of the concepts and uses of measurement and similarity.

(8.8) **Measurement.** The student uses procedures to determine measures of three-dimensional figures. The student is expected to

(A) find lateral and total surface area of prisms, pyramids, and cylinders using [concrete] models and nets (two-dimensional models);

(B) connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects; and

(C) estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume.

(8.9) **Measurement.** The student uses indirect measurement to solve problems. The student is expected to

(A) use the Pythagorean Theorem to solve real-life problems; and

(B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.

(8.10) **Measurement.** The student describes how changes in dimensions affect linear, area, and volume measures. The student is expected to

(A) describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally; and

(B) describe the resulting effect on volume when dimensions of a solid are changed proportionally.

Objective 9: The student will demonstrate an understanding of percents, proportional relationships, probability, and statistics in application problems.

(8.3) **Patterns, relationships, and algebraic thinking.** The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to

(B) estimate and find solutions to application problems involving percents and other proportional relationships, such as similarity and rates.

(8.11) **Probability and statistics.** The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to

(A) find the probabilities of dependent and independent events; and

(B) use theoretical probabilities and experimental results to make predictions and decisions.

(8.12) **Probability and statistics.** The student uses statistical procedures to describe data. The student is expected to

(A) select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation; and

(C) select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, [stem and leaf plots,] circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.

(8.13) **Probability and statistics.** The student evaluates predictions and conclusions based on statistical data. The student is expected to

(B) recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.

Objective 10: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.

(8.14) **Underlying processes and mathematical tools.** The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;

(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness; and

(C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.

(8.15) **Underlying processes and mathematical tools.** The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

(8.16) **Underlying processes and mathematical tools.** The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to

(A) make conjectures from patterns or sets of examples and nonexamples; and

(B) validate his/her conclusions using mathematical properties and relationships.