VIRGINIA STANDARDS OF LEARNING

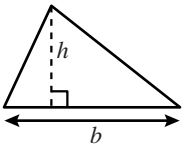
Spring 2007 Released Test

GRADE 8 MATHEMATICS

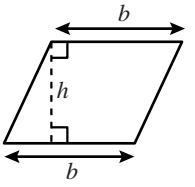
Form M0117, CORE 1

Grade 8 Mathematics Formula Sheet

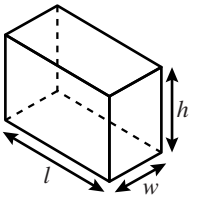
Geometric Formulas



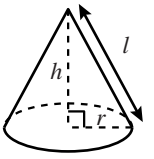
$A = \frac{1}{2}bh$



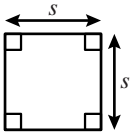
$A = bh$



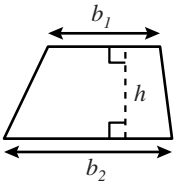
$V = lwh$
$S.A. = 2lw + 2lh + 2wh$



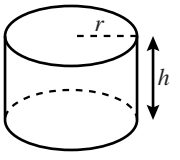
$V = \frac{1}{3}\pi r^2 h$
$S.A. = \pi rl + \pi r^2$



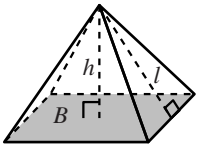
$p = 4s$
$A = s^2$



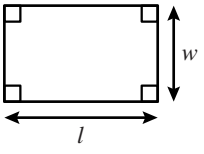
$A = \frac{1}{2}h(b_1 + b_2)$



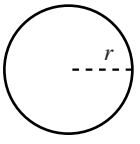
$V = \pi r^2 h$
$S.A. = 2\pi rh + 2\pi r^2$



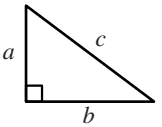
$V = \frac{1}{3}Bh$
$S.A. = \frac{1}{2}lp + B$



$p = 2l + 2w$
$A = lw$



$C = 2\pi r$
$A = \pi r^2$



$c^2 = a^2 + b^2$

Abbreviations

milligram	mg
gram	g
kilogram	kg
milliliter	mL
liter	L
kiloliter	kL
millimeter	mm
centimeter	cm
meter	m
kilometer	km
square centimeter	cm^2
cubic centimeter	cm^3

ounce	oz
pound	lb
quart	qt
gallon	gal.
inch	in.
foot	ft
yard	yd
mile	mi.
square inch	sq in.
square foot	sq ft
cubic inch	cu in.
cubic foot	cu ft

volume	*V*
total surface area	*S.A.*
area of base	*B*

year	yr
month	mon
hour	hr
minute	min
second	sec

Pi

$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

Directions

Read and solve each question. Then mark the space on your answer document for the best answer.

SAMPLE

Vicki had $228. She spends $37 on a gift. How much did she have left?

A $211
B $191
C $181
D $164

GO ON

1 Which is equivalent to this expression?

$$\left(6-3\right)^4$$

A 1,280
B 81
C 12
D 7

2 Which set contains $\sqrt{7}$?

F {Rational numbers}
G {Natural numbers}
H {Irrational numbers}
J {Integers}

3 Which number is *not* equivalent to the other three?

A 0.8×1^2

B 8×10^2

C 80×10^1

D 800×1^1

4 Which number has the *least* value?

F 7.63×10^4

G 3.55×10^6

H 9.98×10^3

J 1.05×10^5

5 Which of the following has a different value than the others?

A $\frac{6}{8}$

B $\frac{3}{4}$

C 50%

D 0.75

6 Which subset of real numbers does *not* contain the number 1?

F Whole numbers
G Irrational numbers
H Integers
J Natural numbers

7 Which operation should be performed first to simplify the following?

$$15 - 9 \div \left(^{-}3\right)^2$$

A Subtract 9 from 15
B Divide 9 by ($^{-}3$)
C Multiply 2 times ($^{-}3$)
D Square ($^{-}3$)

8 **What is the value of $(n-2)^2+n-1$ when $n=4$?**

F 7

G 9

H 15

J 17

9 **The scale blueprint of a rectangular patio is drawn $\frac{1}{8}$ inch to 1 foot. If the patio is 14 feet long, what is the measure of the patio's length on the blueprint?**

A $\frac{8}{14}$ in.

B $\frac{4}{7}$ in.

C $1\frac{3}{4}$ in.

D $3\frac{1}{4}$ in.

10 Which of the following is a perfect square?

F 5
G 10
H 11
J 16

11 Fuji apples sold for $1.29 per pound while Golden Delicious apples were on sale for $0.89 per pound. Sandi bought $3\frac{1}{2}$ pounds of each kind. How much more did she pay for the Fuji apples than the Golden Delicious apples?

A $1.40
B $3.12
C $4.51
D $7.63

12 If $x = 8$, what is the value of this expression?

$$\frac{x}{4} - 3$$

F $^{-}2.5$
G $^{-}1$
H 1
J 2.5

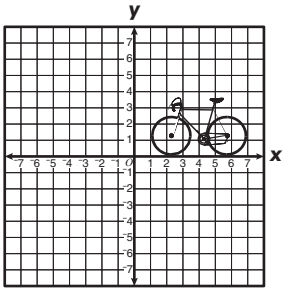
13 Which number is a perfect square?

A 1
B 2
C 5
D 8

14 Harry and Connie bought tomatoes at the farmer's market. Harry paid $4.32 for 6 pounds of tomatoes. At that rate, how much should Connie have paid for 5 pounds of tomatoes?

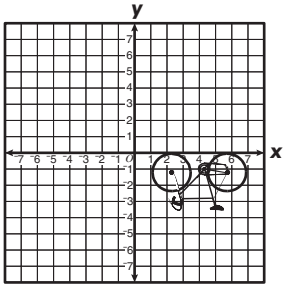
F $2.16
G $3.60
H $5.04
J $5.18

15 Reflect the figure across the *y*-axis.

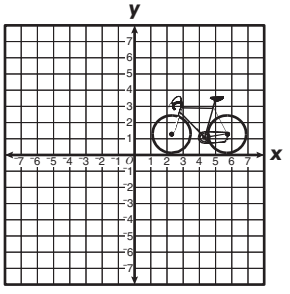


Which is most likely the new figure?

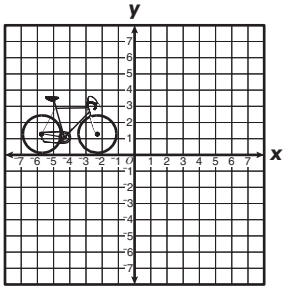
A



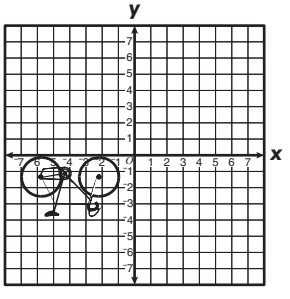
B



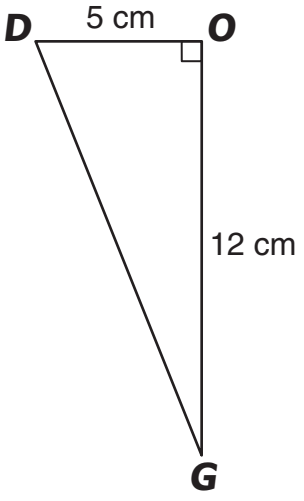
C



D



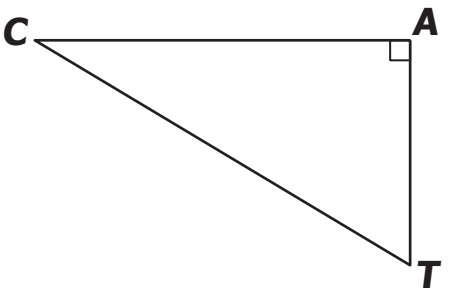
16 Dale drew triangle *DOG* with the given measurements.



What is the measure of $\overline{DG}$?

F 17 cm
G 13 cm
H 11 cm
J 7 cm

17 Triangle *CAT* was in Cedric's mathematics book.



Which is the hypotenuse of the triangle?

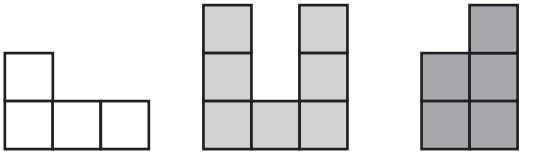
A $\angle TAC$

B $\overline{TA}$

C $\angle CTA$

D $\overline{CT}$

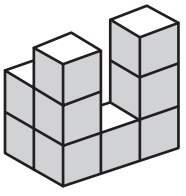
18 This shows 3 different views of a three-dimensional figure made from cubes.



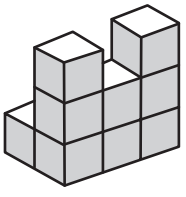
Top Front Left Side

Which could be a drawing of the figure?

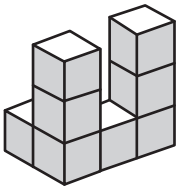
F



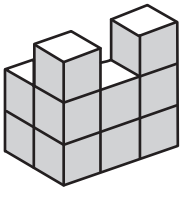
G



H

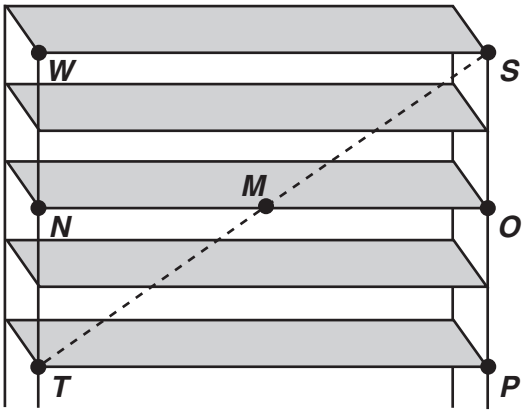


J



GO ON

19 Betty added a support to her metal shelves.

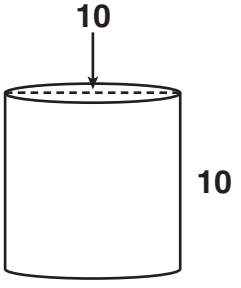


If $\angle SMO$ measures 45°, what is the measure of $\angle SMN$?

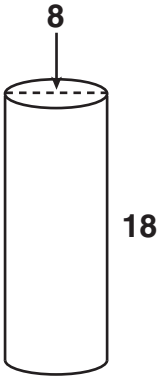
A 45°
B 90°
C 135°
D 180°

20 If all measurements of the right prisms and cylinders are in inches, which container has the greatest volume?

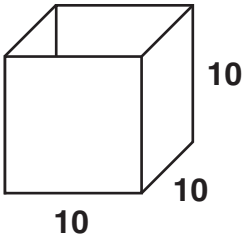
F



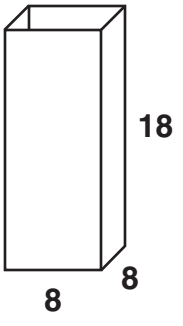
G



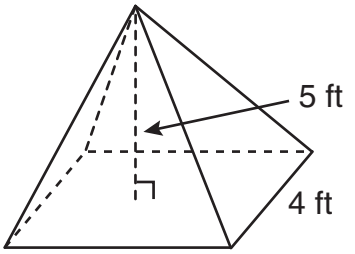
H



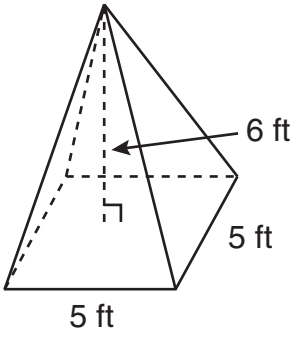
J



21



Pyramid I



Pyramid II

Which statement about the volumes of the two pyramids shown above is true?

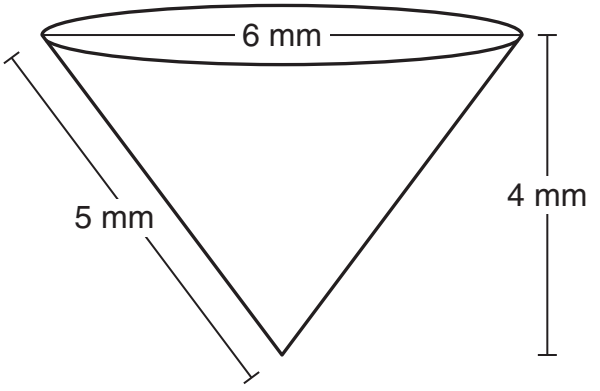
A The volume of Pyramid II is 10 times the volume of Pyramid I.

B The volumes of Pyramid II and Pyramid I are the same.

C Pyramid II has 10 more cubic feet of volume than Pyramid I.

D Pyramid II has 30 more cubic feet of volume than Pyramid I.

22 Which is closest to the surface area of a cone with dimensions as shown?



F 66 mm^2

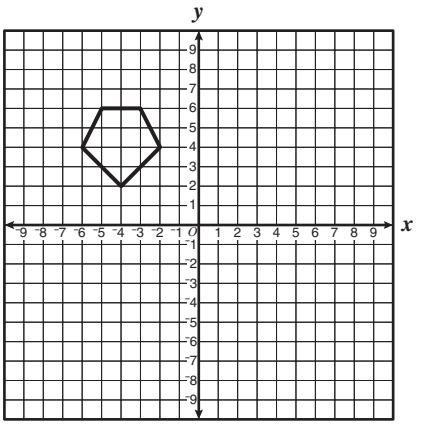
G 75 mm^2

H 113 mm^2

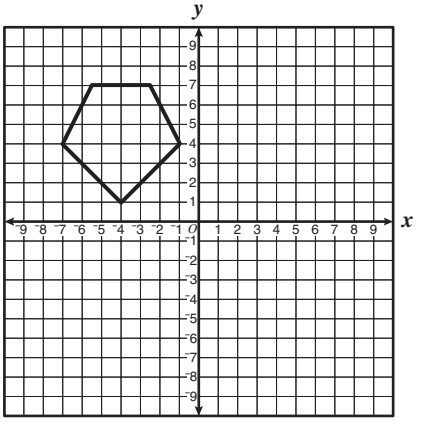
J 207 mm^2

GO ON

23 A transformation was performed on the following figure.



The result is the figure below.



What type of transformation was performed on the original figure?

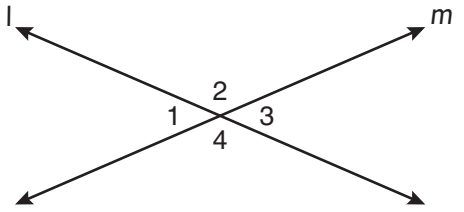
A Dilation

B Reflection

C Rotation

D Translation

24 Lines *l* and *m* intersect, forming the angles indicated in the drawing.



Which of the following statements *must* be true?

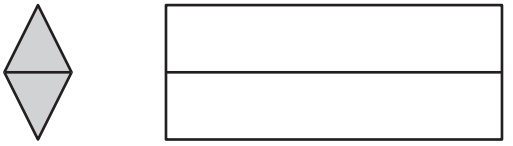
F $\angle 1$ is congruent to $\angle 2$.

G $\angle 1$ is supplementary to $\angle 3$.

H $\angle 2$ is congruent to $\angle 4$.

J $\angle 2$ is supplementary to $\angle 4$.

25 A figure has the views shown.

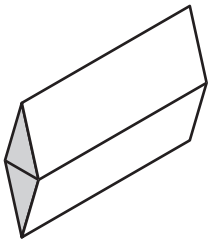


Front View

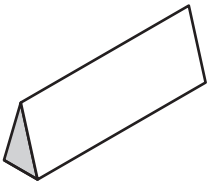
Right Side View

Which represents the figure?

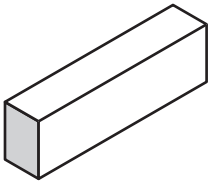
A



B

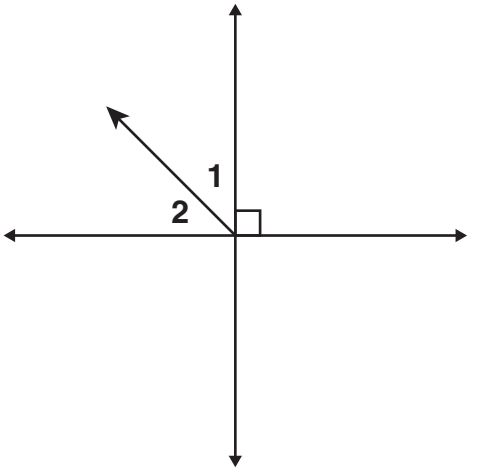


C



D

26 Two lines and a ray intersect at a single point as shown below.



In the drawing above, what is $m\angle 1$ if $m\angle 2 = 40°$?

F 40°
G 45°
H 50°
J 55°

27 Which matrix has a 2 and a 5 in the same column?

A $\begin{bmatrix} 2 & 0 & 2 \\ 0 & 5 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

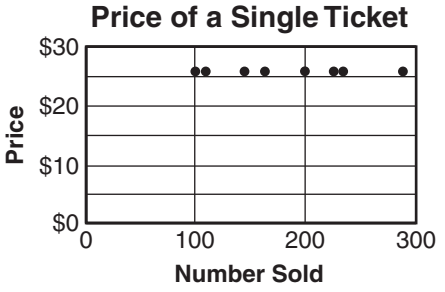
B $\begin{bmatrix} 0 & 1 & 1 \\ 2 & 1 & 5 \\ 2 & 5 & 1 \end{bmatrix}$

C $\begin{bmatrix} 2 & 3 & 4 \\ 7 & 8 & 9 \\ 4 & 5 & 6 \end{bmatrix}$

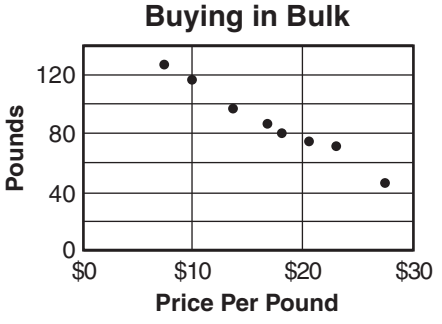
D $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$

28 Which scattergram contains data with a positive relationship?

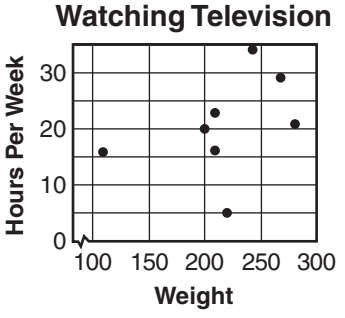
F



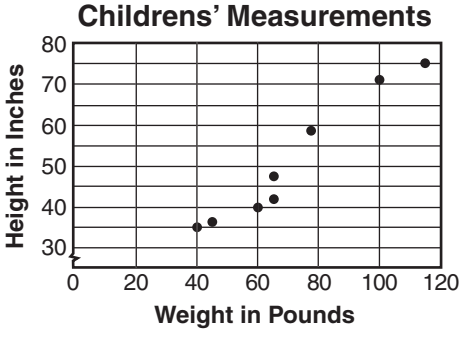
G



H



J



GO ON

29 During basketball practice, Jada attempted 52 free throws and made 16 of them. Based on that rate, what is the probability that she will make the next free throw she attempts?

A $\frac{4}{13}$

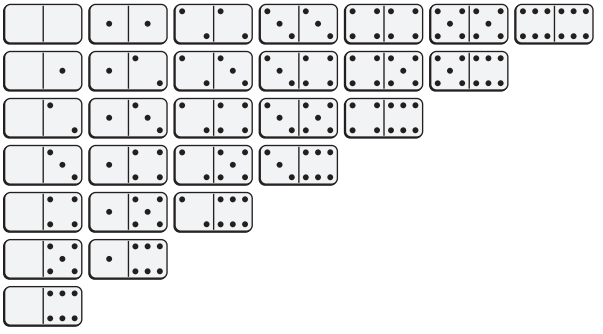
B $\frac{4}{9}$

C $\frac{5}{9}$

D $\frac{9}{13}$

GO ON

30 This is a standard set of dominoes.



The dominoes are turned over and shuffled thoroughly, and one is chosen at random. What is the probability that the *total* number of spots showing on the one chosen will be greater than 6?

F $\frac{2}{7}$

G $\frac{3}{7}$

H $\frac{11}{28}$

J $\frac{4}{9}$

31 Rocky has a $\frac{3}{140}$ chance of winning a trip to New York City. Which of the following best describes Rocky's chances of winning the trip?

A It is certain that Rocky will win the trip.

B It is likely that Rocky will win the trip.

C It is unlikely that Rocky will win the trip.

D It is impossible that Rocky will win the trip.

32 Which is a 2-by-6 matrix?

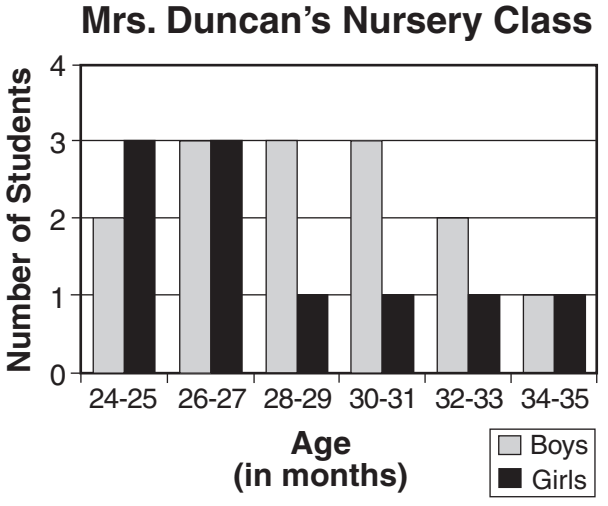
F $\begin{bmatrix} 1 & 1 \\ 5 & 7 \\ 2 & 9 \\ 6 & 6 \\ 3 & 0 \\ 7 & 4 \end{bmatrix}$

G $\begin{bmatrix} 6 & 6 \\ 6 & 6 \end{bmatrix}$

H $\begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix}$

J $\begin{bmatrix} 1 & 5 & 2 & 6 & 3 & 7 \\ 1 & 7 & 9 & 6 & 0 & 4 \end{bmatrix}$

33 The graph below shows the ages in months of the boys and girls in Mrs. Duncan's nursery class.



Which conclusion can be justified by the data shown in the bar graph?

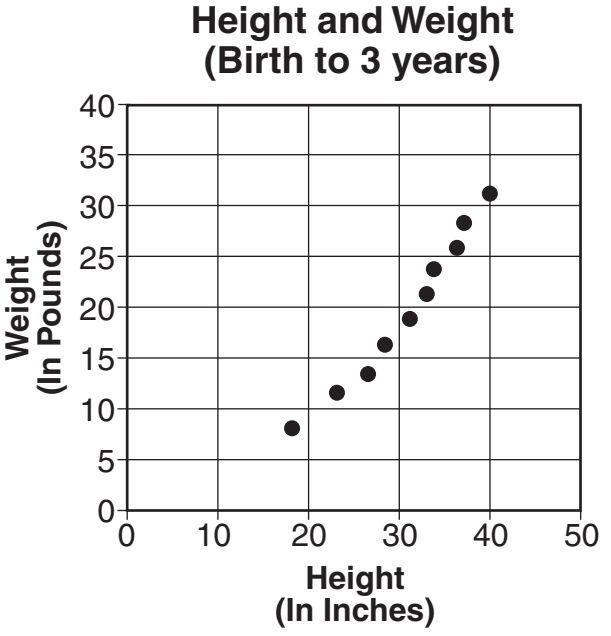
A The students in the class are at least 2 years old.

B There are more girls than boys who are 26 to 27 months old in the class.

C Most students in the class are older than 30 months.

D There are more girls than boys in the class.

34 The scatterplot below shows Sarah's height and weight at various times from birth to her third birthday.



Based on the scatterplot, which of the following conclusions about the relationship between her height and weight is true?

F There is a negative relationship between height and weight.

G There is a positive relationship between height and weight.

H There is a constant relationship between height and weight.

J There is no relationship between height and weight.

35 A function of *x* containing four ordered pairs of the form (*x, y*) is shown below.

$$\{(1, 3), (2, 4), (5, 7), (6, 8)\}$$

What is the domain of the function?

A $\{1, 2, 5, 6\}$

B $\{3, 4, 7, 8\}$

C $\{1, 2, 3, 4\}$

D $\{5, 6, 7, 8\}$

36 Given the function of *x* defined by

$$y = 3x + 5,$$

if the domain is $\{-4, -1, 2, 5\}$, what is the range?

F $\{-20, -11, -2, 7\}$

G $\{-7, -3, -2, -1\}$

H $\{-3, -2, -1, 0\}$

J $\{-7, 2, 11, 20\}$

37

$x \cdot x^2 = x^3$
$x^2 \cdot x^2 = x^4$
$x^3 \cdot x^2 = x^5$
$x^4 \cdot x^2 = x^6$
$x^5 \cdot x^2 = x^7$

Which statement generalizes the pattern shown in the table above?

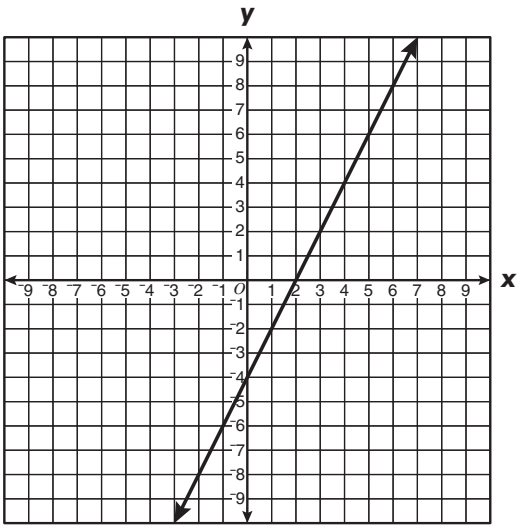
A $x^m \cdot x^n = x^{(m+n)}$

B $x^m \cdot x^n = x^{(n-m)}$

C $x^m \cdot x^n = x^{(m-n)}$

D $x^m \cdot x^n = x^{(m+m)}$

38



Which could be the table of values that was used to graph the function of *x* shown?

F

x	*y*
0	4
2	0
4	4
6	8

G

x	*y*
0	−4
1	0
2	4
3	8

H

x	*y*
0	−4
1	−2
2	0
3	3

J

x	*y*
0	−4
2	0
4	4
6	8

39 **What is the solution to $\frac{x}{4} + 10 = 34$?**

A 4

B 6

C 96

D 144

40 **The formula shows that *c*, the total cost of buying pizzas at Al's Restaurant, depends on *p*, the number of pizzas ordered.**

$$c = 9p$$

What is the independent variable in the formula?

F p

G c

H 9

J $=$

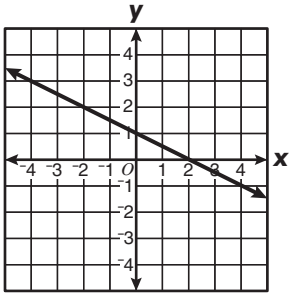
GO ON

41

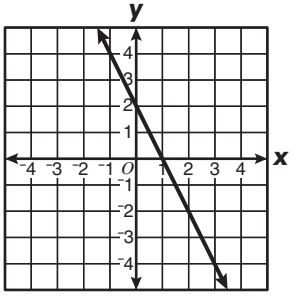
x	y
−1	4
0	2
1	0

Which graph best represents the line defined by the table of ordered pairs?

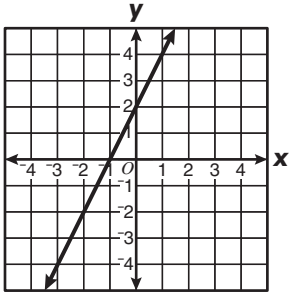
A



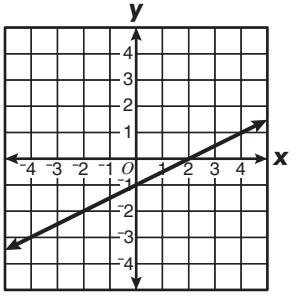
B



C



D



42 What is the solution to the proportion below?

$$\frac{x}{50} = \frac{5.5}{1}$$

F 275

G 27.5

H 9.09

J $9\frac{1}{11}$

GO ON

43 Which table could be used to graph the following?

$$y = \frac{1}{3}x + 7$$

A

x	y
−3	6
0	7
3	8
6	9

B

x	y
−3	$1\frac{1}{3}$
0	$2\frac{1}{3}$
3	$3\frac{1}{3}$
6	$4\frac{1}{3}$

C

x	y
−3	4
0	7
3	10
6	13

D

x	y
−3	$-2\frac{2}{3}$
0	$\frac{1}{3}$
3	$2\frac{1}{3}$
6	$4\frac{1}{3}$

44 Which is the closest to the circumference of a circle with a diameter of 17 inches?

F 27 in.

G 53 in.

H 227 in.

J 907 in.

45 A cylindrical chemical tank is 12 feet high and has a diameter of 45 feet. Which is closest to the number of cubic feet of liquid the tank will hold?

A 38,151

B 19,076

C 15,890

D 141

46

x	*y*
0	−1
2	3
3	5
4	7

Which is true for all pairs of values in the table above?

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

G $y = 2x - 1$

H $y = x - 1$

J $y = x + 1$

47 What value of *x* makes the following statement true?

$$\mathbf{19 = 5}x \mathbf{+ 4}$$

A 23

B 15

C 4

D 3

48 Which is one of the solutions to the following?

$$2x + 4 < 12$$

F 6
G 5
H 4
J 3

49 Which is a table of ordered pairs defined by $y = 2x - 12$?

A

x	12	15	22	30
y	12	18	32	48

B

x	10	12	14	16
y	−4	0	4	8

C

x	5	6	10	12
y	22	24	32	36

D

x	10	15	20	25
y	−2	3	8	13

50 Which table of ordered pairs could be used to graph $y = 4x - 5$?

F

x	0	1	3	5
y	-1	1	-7	-20

G

x	0	1	3	5
y	-5	-1	7	15

H

x	0	1	3	5
y	0	-2	-6	-10

J

x	0	1	3	5
y	4	0	-4	-8

STOP