VIRGINIA STANDARDS OF LEARNING

Spring 2009 Released Test

GRADE 8
MATHEMATICS

Form M0119, CORE 1

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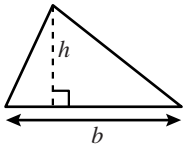
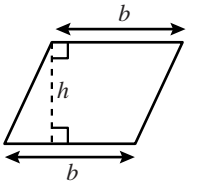
Grade 8 Mathematics Formula Sheet

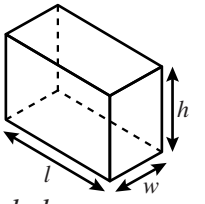
Geometric Formulas



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

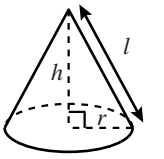


$A = bh$



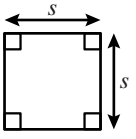
$V = lwh$

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



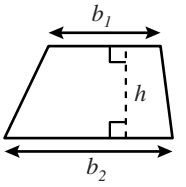
$V = \frac{1}{3}\pi r^2 h$

$S.A. = \pi rl + \pi r^2$

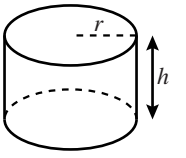


$p = 4s$

$A = s^2$

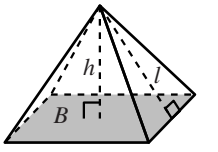


$A = \frac{1}{2}h(b_1 + b_2)$



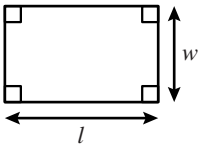
$V = \pi r^2 h$

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



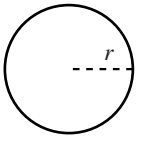
$V = \frac{1}{3}Bh$

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



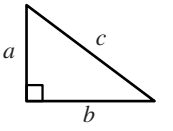
$p = 2l + 2w$

$A = lw$



$C = 2\pi r$

$A = \pi r^2$



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

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 each question and choose 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 According to the order of operations, which operation should be performed first to simplify the expression?

$$\mathbf{12 + 2 \cdot 5^2 - 1}$$

A $12 + 2$

B $5 - 1$

C $2 \cdot 5$

D 5^2

2 $\mathbf{5.78 \times 10^5} =$

F 57,800,000
G 578,000
H 0.0000578
J 0.00000578

3 Which of the following does *not* contain the number 24 ?

A Integers
B Whole numbers
C Natural numbers
D Irrational numbers

4 Which value is equivalent to $22 - 2^3$?

F 14
G 16
H 20
J 30

5 What is 102,000,000 expressed in scientific notation?

A 1.02×10^9
B 1.02×10^8
C 1.02×10^7
D 1.02×10^6

6 Which of the following is *not* a rational number?

F $^{-}0.75$
G 0
H $\sqrt{4}$
J $\sqrt{15}$

7 Which statement is true?

A $0.09 > \frac{7}{8}$

B $6\% < 0.09$

C $\frac{7}{8} < 8.0 \times 10^{-3}$

D $8.0 \times 10^{-3} > 6\%$

8 Between which two whole numbers is $\sqrt{33}$?

F 32 and 34
G 16 and 17
H 6 and 7
J 5 and 6

9 What is the value of the following when $v = 2$?

$$5(v - 10) - 7$$

A $^{-}47$
B $^{-}7$
C 7
D 47

10 The school had a fundraiser. Students collected money at three locations. They spent $17.80 on materials.

Money Raised at School Fundraiser

Location 1	Location 2	Location 3
$87.95	$49.40	$64.25

How much money did they make in the fundraiser after subtracting the cost of materials?

F $148.20
G $183.80
H $201.60
J $219.40

11 What is the value of $3(x^2 - 4x)$ when $x = 5$?

A 5
B 15
C 30
D 55

12 Which of the following numbers is a perfect square?

F 36
G 28
H 22
J 14

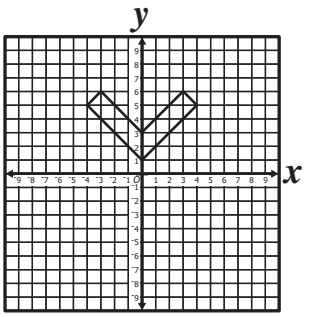
13 What is the value of the expression $5(a+b)-3(b+c)$ if $a=4$, $b=3$, and $c=2$?

A 20
B 18
C 14
D 10

14 The running shoes Gina bought at a 20%-off sale were originally priced at $70. Before tax was added, how much money did Gina save by buying the shoes on sale?

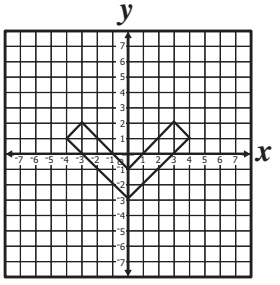
F $7
G $10
H $14
J $20

15

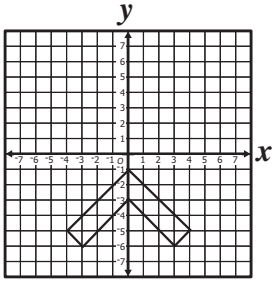


Which of the following shows the figure after it has been reflected over the horizontal axis?

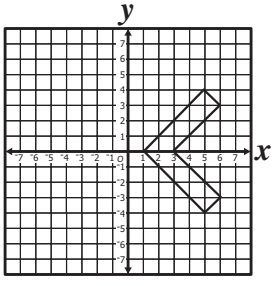
A



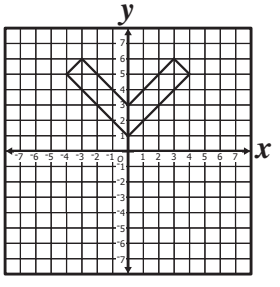
B



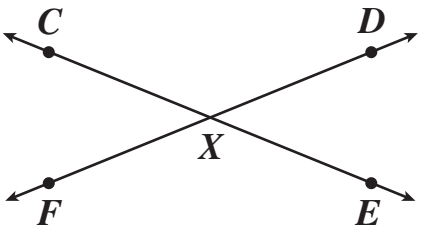
C



D



16 **If $\overleftrightarrow{CE}$ intersects $\overleftrightarrow{DF}$ at X, which angle *must* be congruent to $\angle CXD$?**



F $\angle CXF$

G $\angle DXE$

H $\angle FXD$

J $\angle FXE$

17 **What is the volume of a square-based pyramid with base side lengths of 16 meters, a slant height of 17 meters, and a height of 15 meters?**

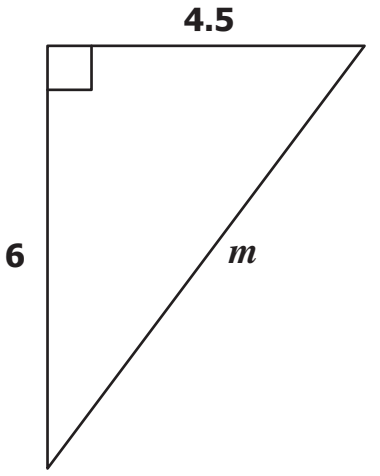
A 1,280 m^3

B 1,360 m^3

C 1,450 m^3

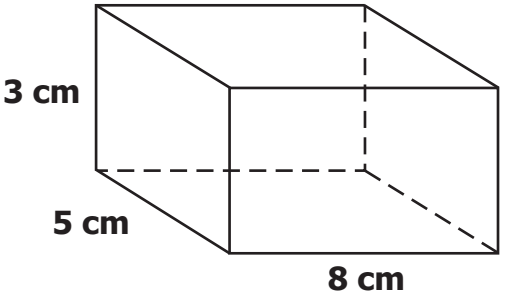
D 2,040 m^3

18 What is the value of m in the right triangle shown?



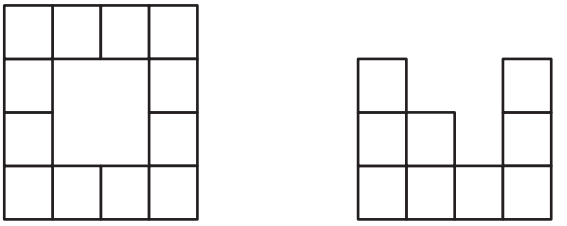
F 1.5
G 4.0
H 7.5
J 10.5

19 What is the surface area of the rectangular prism shown?

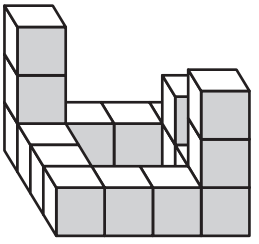


A 40 cm^2
B 79 cm^2
C 120 cm^2
D 158 cm^2

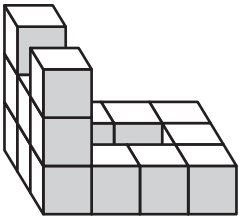
20 A figure has the bottom and left-side views shown, and its front view is shaded. Which represents the figure?



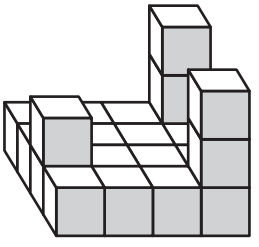
F



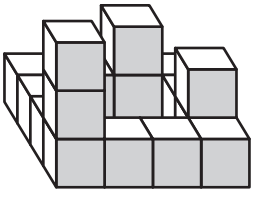
G



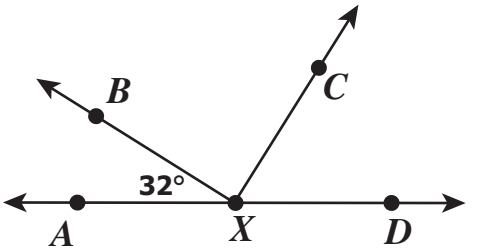
H



J



21 **In this figure, two rays intersect $\overleftrightarrow{AD}$ at point X. The measure of $\angle AXB$ is 32°. The figure is not necessarily drawn to scale.**



What is the measure of $\angle BXD$?

A 58°

B 90°

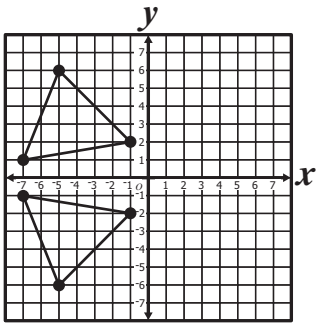
C 122°

D 148°

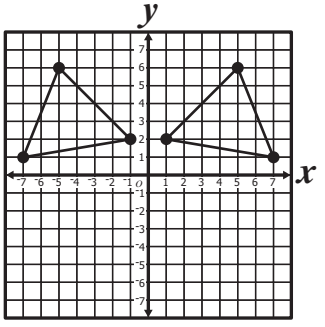
GO ON

22 Which graph shows only a translation?

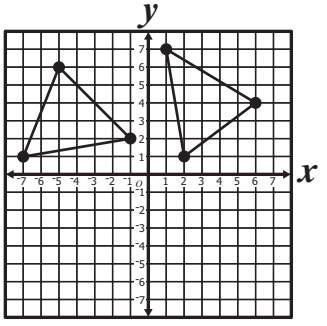
F



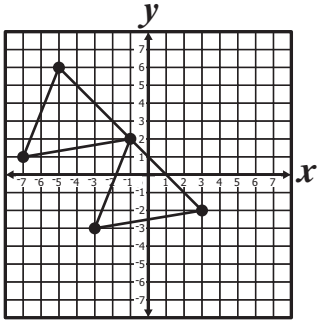
G



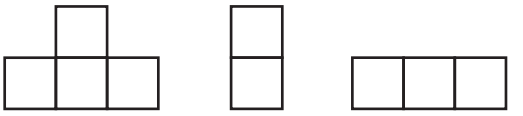
H



J



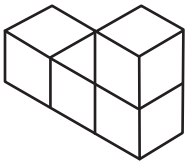
23 Three different views of a three-dimensional figure constructed from cubes are shown.



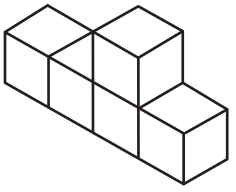
Front **Right Side** **Top**

Which figure could be represented by these views?

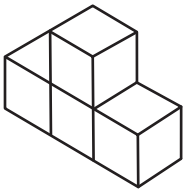
A



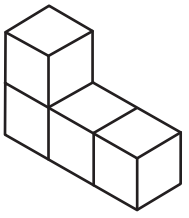
B



C



D



24 The legs of a right triangle measure 9 inches and 12 inches. What is the length of the hypotenuse of this triangle?

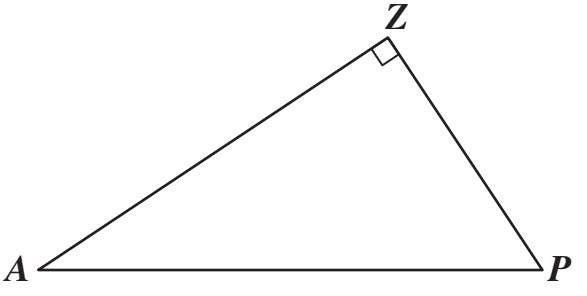
F 3 in.

G 8 in.

H 15 in.

J 21 in.

25



Which correctly names the hypotenuse of the triangle pictured?

A $\angle PZA$

B $\angle APZ$

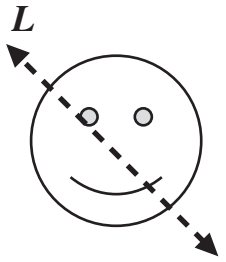
C $\overline{PZ}$

D $\overline{AP}$

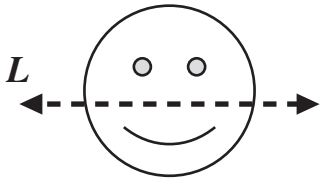
GO ON

26 In which figure is line L most likely a line of reflection?

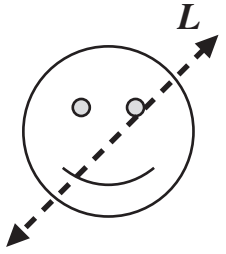
F



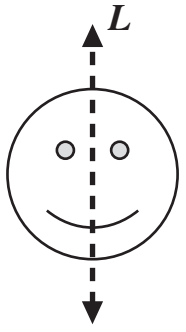
G



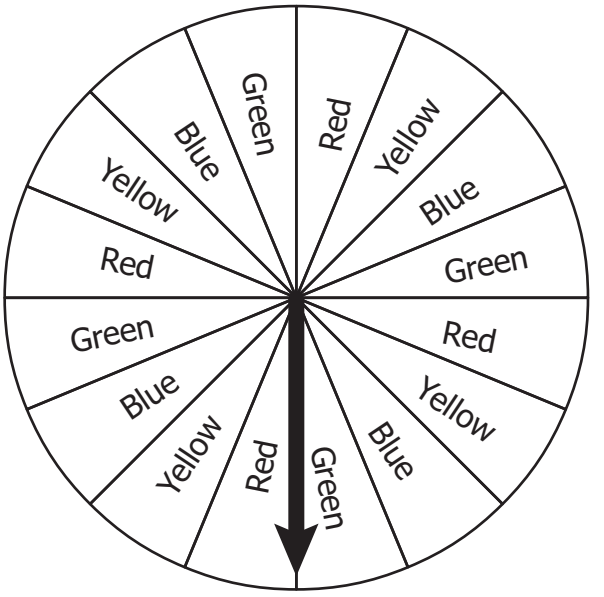
H



J



27 Jill is playing a game with a spinner like the one pictured below.



If the sections are congruent, what is the probability that on Jill's next spin the arrow will land on a section labeled red?

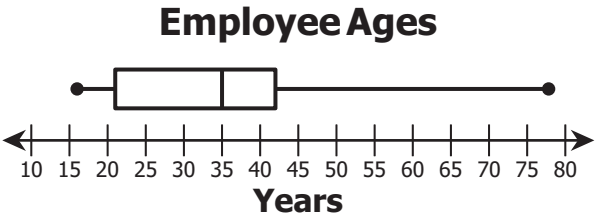
A $\frac{1}{3}$

B $\frac{1}{4}$

C $\frac{1}{15}$

D $\frac{1}{16}$

28 The box-and-whisker plot shows the ages of employees at a local company.



What is the apparent upper quartile of this plot?

F 21
G 35
H 42
J 78

29 Which element is located at row 3, column 2 ?

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

A 2
B 7
C 8
D 9

30 This graph shows the number of students on the honor roll at three schools.

Students on the Honor Roll

School	Number of Students
A	
B	
C	

Key: = 50 students

What is the total number of students on the honor roll at these three schools?

F 525
G 550
H 575
J 600

31 In Happy Hills Pond, 2 out of 5 fish are goldfish. If 40 fish were randomly chosen from the pond, which is most likely the number of goldfish chosen?

A 8
B 16
C 24
D 37

32 The matrix shows the number of male and female students in each of the classes at Bradley High School.

$$\begin{array}{r} \\ \textbf{Freshman} \\ \textbf{Sophomore} \\ \textbf{Junior} \\ \textbf{Senior} \end{array} \begin{array}{c} \begin{array}{cc} \textbf{Male} & \textbf{Female} \end{array} \\ \begin{bmatrix} 713 & 837 \\ 924 & 626 \\ 770 & 780 \\ 589 & 941 \end{bmatrix} \end{array}$$

According to the matrix, how many male sophomores are there?

F 626
G 770
H 924
J 1,550

GO ON

33 The table shows all of the possible outcomes when Juan tosses a penny, a nickel, and a quarter at the same time.

Penny	Nickel	Quarter
Heads	Heads	Heads
Heads	Heads	Tails
Heads	Tails	Heads
Heads	Tails	Tails
Tails	Heads	Heads
Tails	Heads	Tails
Tails	Tails	Heads
Tails	Tails	Tails

What is the probability that Juan's result will be 3 tails on his first toss?

A $\frac{1}{8}$

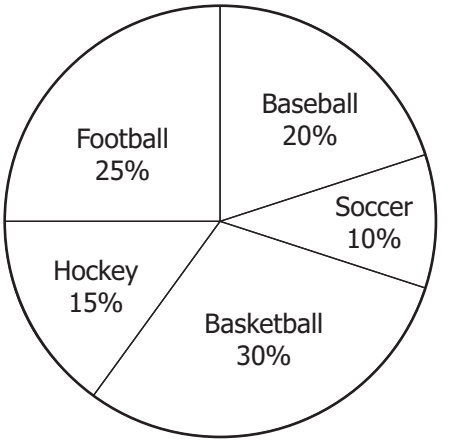
B $\frac{1}{4}$

C $\frac{1}{3}$

D $\frac{1}{2}$

34 Manuel surveyed his class to determine each student's favorite sport. According to the circle graph, what percent of Manuel's classmates selected football or baseball as their favorite sport?

Favorite Sports



F 20%

G 25%

H 45%

J 55%

GO ON

35 In which table do all the ordered pairs make the following equation true?

$$x + 3y = 15$$

A

x	y
0	5
3	4
6	3

B

x	y
5	0
4	3
3	6

C

x	y
–3	6
–6	7
–9	9

D

x	y
6	–3
7	–6
9	–9

36 Which rule represents the relation shown in the table?

x	y
2	1
3	3
4	5
5	7
6	9

F $y = x - 1$
G $y = x + 3$
H $y = 2x - 3$
J $y = 2x + 3$

37 Jenna uses 36 beads to make 4 bracelets. How many of the same type of bracelet can Jenna make with 108 beads?

A 12
B 27
C 432
D 972

38 The following set of ordered pairs of the form (x, y) lie on the graph of a function of x.

$$\{(0, {}^{-}1), (1, 2), (2, 5), (3, 8)\}$$

Which equation describes the function?

F $y = 2x + 1$

G $y = x - 1$

H $y = x + 5$

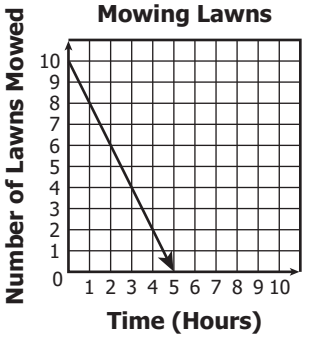
J $y = 3x - 1$

39 The table shows the number of hours it takes to mow a certain number of lawns.

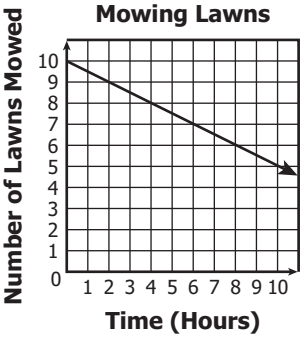
Time (hours)	Number of Lawns Mowed
4	2
6	3
8	4
10	5

Which graph *best* represents the relationship shown in the table?

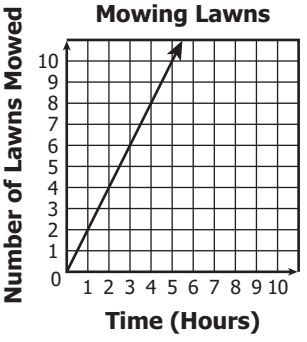
A



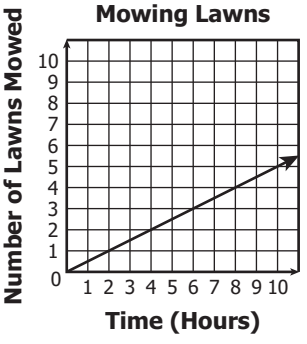
B



C



D



GO ON

40 What value of n makes the equation true?

$$\frac{2}{3}n + 4 = 10$$

F $14\frac{2}{3}$

G 9

H $5\frac{1}{3}$

J 4

41 The formula for converting temperatures from Celsius to Fahrenheit is $F = \frac{9}{5}C + 32$. Which temperature, in degrees Fahrenheit, is closest to 60°C?

A 50.4°F
B 65.3°F
C 140.0°F
D 165.6°F

42 What is the domain of this relation?

$$\{(1, {}^{-}4),\ (3, 6),\ ({}^{-}1, 1),\ (6, 0)\}$$

F $\{1,\ 6\}$

G $\{{}^{-}4,\ 0,\ 1,\ 6\}$

H $\{{}^{-}1,\ 1,\ 3,\ 6\}$

J $\{{}^{-}4,\ {}^{-}1,\ 0,\ 1,\ 3,\ 6\}$

43 What is the value of x in the following equation?

$${}^{-}4x + 2 = {}^{-}14$$

A ${}^{-}4$

B ${}^{-}3$

C 3

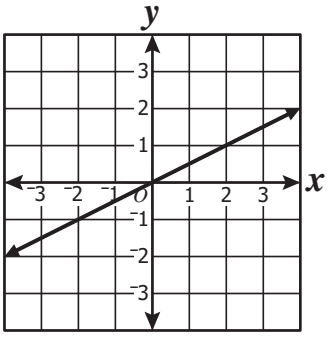
D 4

44

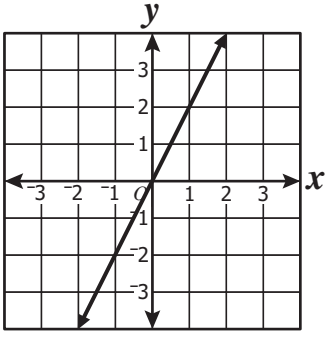
x	y
-2	-1
0	0
2	1

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

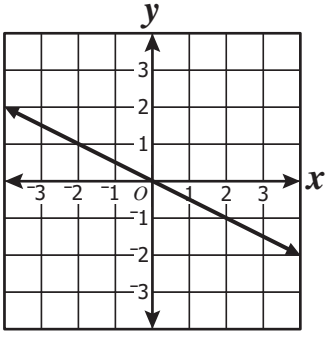
F



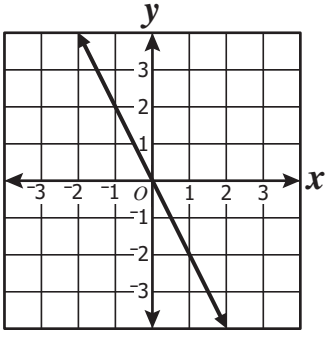
G



H



J



GO ON

45 The values for a function of x are in the table.

x	y
1	3.14
2	12.56
3	28.26
4	50.24

What is the range of the function?

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

B $\{3.14,\ 12.56,\ 28.26,\ 50.24\}$

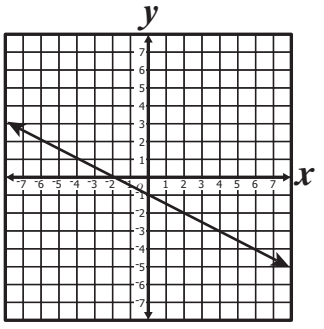
C $\{(1, 3.14),\ (2, 12.56),\ (3, 28.26),\ (4, 50.24)\}$

D $\{1,\ 2,\ 3,\ 4,\ 3.14,\ 12.56,\ 28.26,\ 50.24\}$

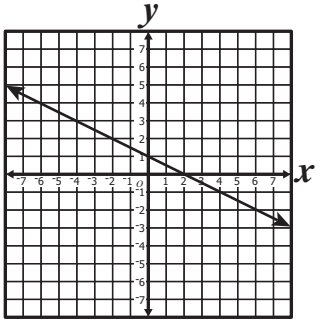
46 Which graph contains the ordered pairs in the table?

x	y
–2	0
0	–1
4	–3

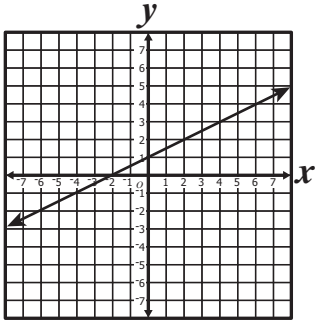
F



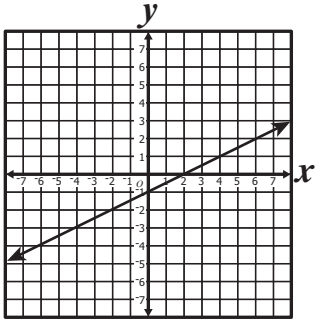
G



H



J



47 **A function of x is defined by the following equation.**

$$y = 5x + 12$$

What is the independent variable?

A x
B y
C 5
D 12

48 **The profit, P, a school makes selling x tickets to a play can be determined by the formula $P = 8x - 400$. If the school made a profit of $1200 on the play, how many tickets were sold?**

F 100
G 150
H 200
J 250

49 What value of w makes the following true?

$$3w - 5 = 7$$

A $^{-}4$

B $^{-}1$

C 1

D 4

50 To graph the equation $y = 3x - 7$, Renita created the following table of values.

x	y
-1	-10
0	-7
7	**?**

Which y-value corresponds to 7 ?

F $^{-}4$

G 14

H 21

J 28

STOP

Answer Key-8075-M0119

Test Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	D	001	Number and Number Sense
2	G	001	Number and Number Sense
3	D	001	Number and Number Sense
4	F	001	Number and Number Sense
5	B	001	Number and Number Sense
6	J	001	Number and Number Sense
7	B	001	Number and Number Sense
8	J	002	Computation and Estimation
9	A	002	Computation and Estimation
10	G	002	Computation and Estimation
11	B	002	Computation and Estimation
12	F	002	Computation and Estimation
13	A	002	Computation and Estimation
14	H	002	Computation and Estimation
15	B	003	Measurement and Geometry
16	J	003	Measurement and Geometry
17	A	003	Measurement and Geometry
18	H	003	Measurement and Geometry
19	D	003	Measurement and Geometry
20	F	003	Measurement and Geometry
21	D	003	Measurement and Geometry
22	J	003	Measurement and Geometry
23	C	003	Measurement and Geometry
24	H	003	Measurement and Geometry
25	D	003	Measurement and Geometry
26	J	003	Measurement and Geometry
27	B	004	Probability and Statistics
28	H	004	Probability and Statistics
29	B	004	Probability and Statistics
30	H	004	Probability and Statistics
31	B	004	Probability and Statistics
32	H	004	Probability and Statistics
33	A	004	Probability and Statistics
34	H	004	Probability and Statistics
35	A	005	Patterns, Functions, and Algebra
36	H	005	Patterns, Functions, and Algebra
37	A	005	Patterns, Functions, and Algebra
38	J	005	Patterns, Functions, and Algebra
39	D	005	Patterns, Functions, and Algebra
40	G	005	Patterns, Functions, and Algebra
41	C	005	Patterns, Functions, and Algebra
42	H	005	Patterns, Functions, and Algebra
43	D	005	Patterns, Functions, and Algebra
44	F	005	Patterns, Functions, and Algebra
45	B	005	Patterns, Functions, and Algebra
46	F	005	Patterns, Functions, and Algebra
47	A	005	Patterns, Functions, and Algebra
48	H	005	Patterns, Functions, and Algebra
49	D	005	Patterns, Functions, and Algebra
50	G	005	Patterns, Functions, and Algebra

Grade 8 Math, Core 1

If you get this many items correct:		Then your converted scale score is:
0		000
1		001
2		059
3		94
4		120
5		141
6		158
7		173
8		187
9		199
10		211
11		221
12		231
13		241
14		250
15		259
16		268
17		276
18		284
19		292
20		300
21		307
22		315
23		322
24		330
25		337
26		345
27		352
28		360
29		368
30		375
31		383
32		391
33		399
34		**408**
35		417
36		426
37		435
38		445
39		455
40		466
41		478
42		491
43		**505**
44		520
45		538
46		560
47		586
48		600
49		600
50		600