VIRGINIA
STANDARDS OF LEARNING ASSESSMENTS

Spring 2003 Released Test

END OF COURSE
ALGEBRA I

Property of the Virginia Department of Education

DIRECTIONS
Read and solve each question. For this test you may assume that the value of a denominator is not zero.

SAMPLE

Which is equivalent to $\frac{b^6}{b^2}$?

A $\frac{1}{b^3}$

B b^3

C b^4

D b^8

1 Which property of real numbers is utilized by rewriting $11x + 5xy$ as $x(11 + 5y)$?

A Associative property for addition

B Commutative property for addition

C Closure property for multiplication

D Distributive property for multiplication over addition

2 What is the solution to

$$2 - 4a = 16?$$

F 18

G 10

H $-\frac{7}{2}$

J $-\frac{9}{2}$

3 The volume of a cylinder is given by

$$V = \pi r^2 h$$

where r is the radius of the cylinder and h is the cylinder's height. Which equation could be used to solve for h?

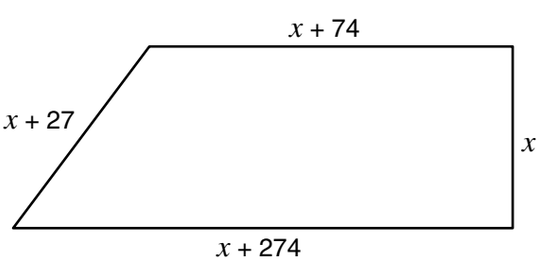
A $h = \pi r^2 V$

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

C $h = V + \pi r^2$

D $h = V - \pi r^2$

4



Tambria's property has the shape of a trapezoid with the dimensions shown. If the perimeter of the property is 3,279 feet, what is the value of x?

F 726 ft

G 781.25 ft

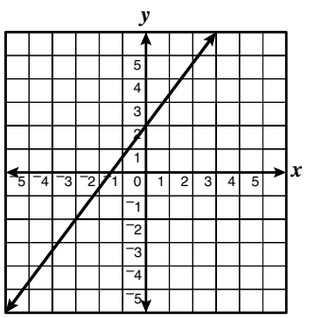
H 913.5 ft

J 1,452 ft

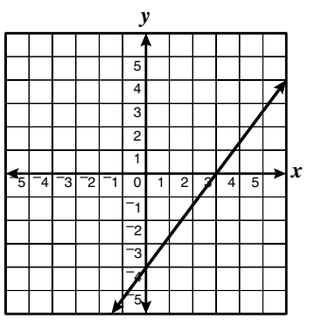
GO ON

5 Which graph best represents the function $y = -\frac{4}{3}x + 2$?

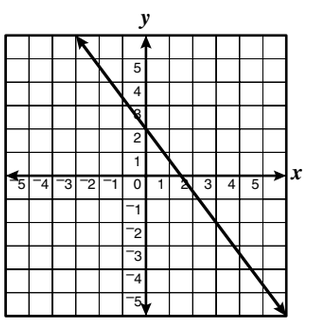
A



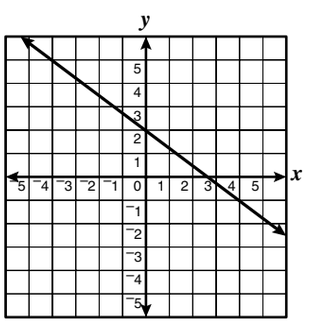
B



C



D



6 What is the solution to the inequality

$$7x - 5 \geq x + 1?$$

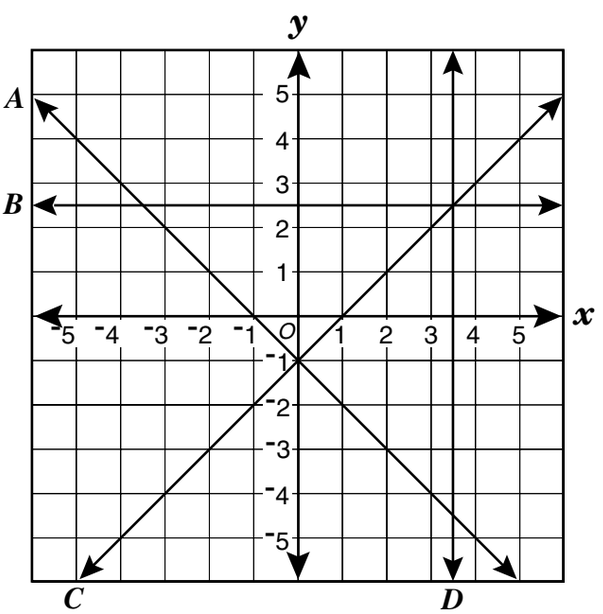
F $x \leq 1$

G $x \geq 1$

H $x \geq -1$

J $x \leq \frac{5}{2}$

7



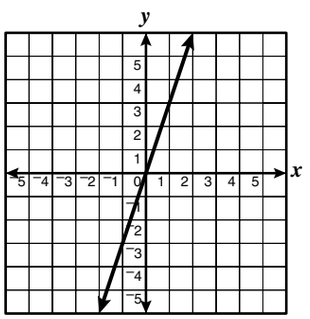
Which line has a negative slope?

A A
B B
C C
D D

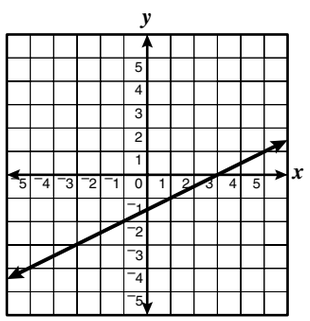
GO ON

8 Which line most likely has a slope of $\frac{1}{2}$ and y-intercept 3?

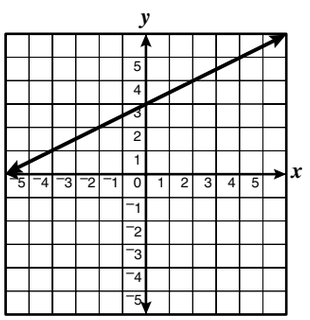
F



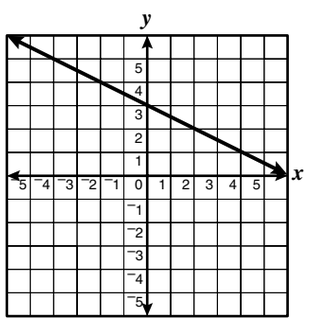
G



H



J



9 What is the slope of the graph of

$$y = 6x - 1?$$

A -6

B -1

C $\frac{1}{6}$

D 6

10 What is the slope of the line that goes through

$(-3, 2)$ and $(3, 2)$?

F Undefined

G 0

H $\frac{2}{3}$

J $\frac{3}{2}$

GO ON

11

x	-2	0	2	4
y	3	2	1	0

Which equation fits the data in the table?

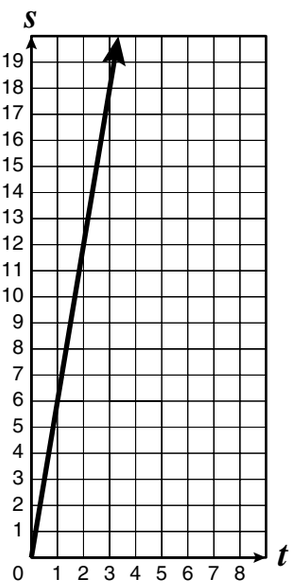
A $y = -\frac{x}{2} + 2$

B $y = x + 3$

C $y = 2x - 3$

D $y = \frac{x}{2} + 2$

12 Roy works at the local grocery store and is paid $6.00 per hour. The graph shown describes his salary, *S*, based on the number of hours, *t*, he works.



Which is an equation of the graph shown?

F $S = 6 + t$

G $S = 6t$

H $S = \frac{6}{t}$

J $S = \frac{t}{6}$

GO ON

13 **The equation of the line that contains the points (⁻8, 1) and (0, ⁻5) is —**

A $y = \frac{3}{4}x + 7$

B $y = \frac{1}{2}x + 1$

C $y = -\frac{3}{4}x - 5$

D $y = -\frac{3}{4}x + 7$

14 $\begin{cases} x + y = 4 \\ x - y = 2 \end{cases}$

Which is the solution to the system of equations shown?

F $x = 1, y = 3$

G $x = 2, y = 2$

H $x = 3, y = 1$

J $x = 4, y = 0$

15 **A rectangle has a perimeter of 68 inches. Its length is 2 inches less than 3 times its width. What are the length and width of the rectangle?**

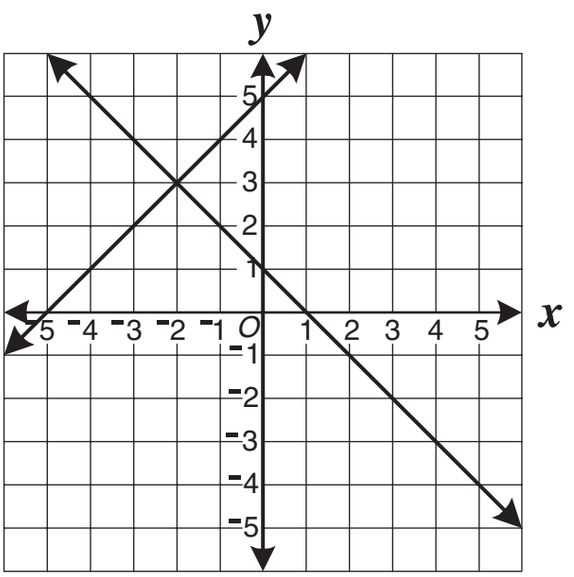
A Length = 22 in., width = 12 in.

B Length = 25 in., width = 9 in.

C Length = 28 in., width = 10 in.

D Length = 22 in., width = 8 in.

16 **This is a graph of a system of equations.**



Which is most likely the solution to the system of equations shown?

F (0, 5)

G (1, 0)

H (3, ⁻2)

J (⁻2, 3)

17 $2x^2 - 3x + 1 = 0$

Which is the solution set for the equation above?

A {⁻2, ⁻1}

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

C $\left\{\frac{1}{2}, 1\right\}$

D {1, 2}

GO ON

18 $x^2 - 4 = 0$

Which is the solution set for the equation above?

F $\{^-4, 1\}$

G $\{^-2, 2\}$

H $\{^-1, 4\}$

J $\{0, 4\}$

19 **What is the value of $3x^2 - y^2$ if $x = ^-1$ and $y = 3$?**

A 12

B $^-3$

C $^-6$

D $^-12$

20 **Which expression correctly represents \$10 less than twice the cost, c?**

F $10 - 2c$

G $10 - 2 + c$

H $2c - 10$

J $\frac{c}{2} - 10$

21 **Which is equivalent to $\frac{x^5y^2z^8}{(xy)^{-3}}$?**

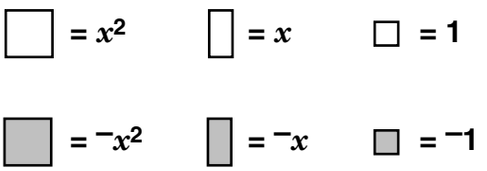
A $\frac{x^2z^8}{y}$

B $x^{12}y^8z^8$

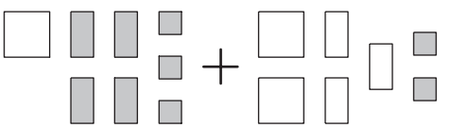
C $\frac{^-x^4yz^8}{3}$

D $x^8y^5z^8$

22 **Consider the following models.**



What polynomial is represented by the following?



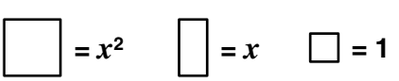
F $3x^2 - x - 5$

G $3x^2 - 7x - 5$

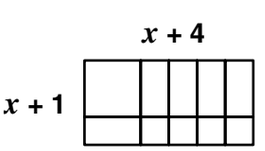
H $3x^2 + 7x - 5$

J $3x^2 + x - 5$

23 **Consider the following models.**



Which expression represents the area of the diagram below?



A $x^2 + 5x + 4$

B $2x + 5$

C $4x + 10$

D $x^2 + 4$

GO ON

24 **The continent of North America has an area of approximately 9.4×10^6 square miles. The area of Asia is approximately 1.74×10^7 square miles. How many square miles larger is Asia than North America?**

F 7.6×10^1
G 7.6×10^{-1}
H 8.0×10^6
J 8.0×10^1

25 **Which expression is equivalent to $(9x + 1)(9x - 1)$?**

A $18x$
B $81x^2 - 1$
C $18x^2 - 1$
D $81x^2 - 18x - 1$

26 **What is one of the factors of**

$$x^2 - 2x - 15?$$

F $(x - 3)$
G $(x - 5)$
H $(x + 1)$
J $(x + 15)$

27 **When completely factored, $4 - 16x + 28y$ equals —**

A $4(1 - 4x + 7y)$
B $4(1 - 4x) + 28y$
C $(4 - 7y)(1 + 4x)$
D $4 - 4(4x - 7y)$

28 **The area of a rectangle is represented by the expression**

$$2x^2 + 5x + 2.$$

Which is an equivalent expression for this area?

F $(2x + 2)(x + 1)$
G $(2x + 3)(x + 2)$
H $(2x + 1)(x + 4)$
J $(2x + 1)(x + 2)$

29 **Which is closest to the value of x if $x = 2\sqrt{7}$?**

A 3.2
B 3.7
C 5.3
D 9.9

30 **What is the value of $\frac{\sqrt{3.2}}{2}$ to the nearest tenth?**

F 0.7
G 0.9
H 1.3
J 1.5

GO ON

31 The numbers in this table follow a linear pattern.

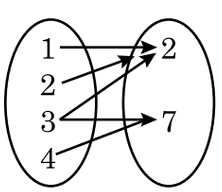
p	*w*
$^{-}3$	14
$^{-}2$	11
$^{-}1$	?
0	5
1	2
2	$^{-}1$

What is the missing value?

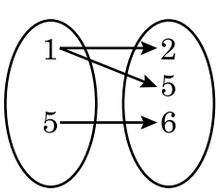
A 7
B 8
C 9
D 10

32 Which of these data sets represents a function?

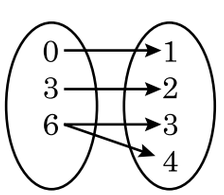
F



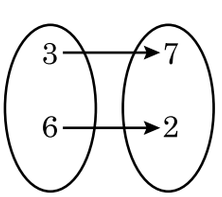
G



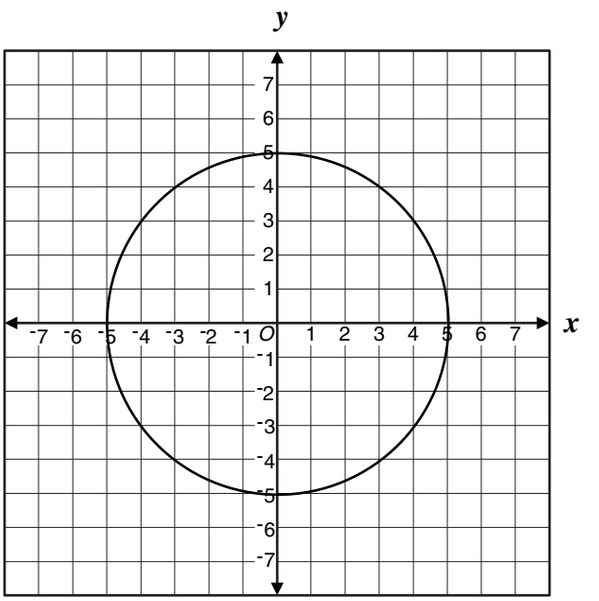
H



J



33 Loki said the following graph does *not* represent a function of *x*.

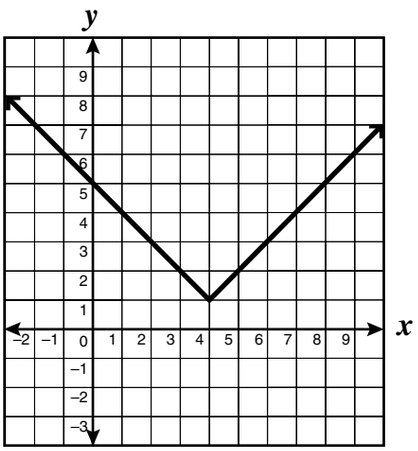


Which pair of points could Loki use to prove that her statement is correct?

A ($^{-}3$, 4) and ($^{-}3$,$^{-}4$)
B ($^{-}4$, 3) and (4, 3)
C ($^{-}3$, 4) and (4,$^{-}3$)
D ($^{-}5$, 0) and (5, 0)

GO ON

34



What is the apparent range of the function of x shown?

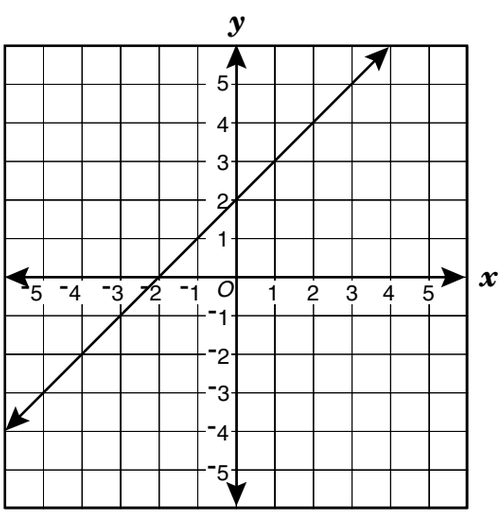
F The set of all real numbers greater than or equal to 4

G The set of all real numbers greater than or equal to 1

H The set of all real numbers less than or equal to 1

J The set of all real numbers

35



Which equation best describes this graph?

A $y = {}^{-}x$

B $y = 2x + 2$

C $y = x - 2$

D $y = x + 2$

36 **If $f(x) = {}^{-}2x + 3$, what is $f({}^{-}4)$?**

F ${}^{-}5$

G ${}^{-}1$

H 5.5

J 11

37 **The chart shows how the wholesale price of an item, p, depends on the cost of the materials needed to produce the item, m. Which equation represents this linear relationship?**

m	\$0.50	\$1.00	\$1.50	\$2.00
p	\$4.00	\$5.00	\$6.00	\$7.00

A $p = m + 3.5$

B $p = 2m + 3$

C $p = 3m + 2.5$

D $p = 4m + 2$

38 **What is the range of the function $f(x) = 3x - 1$ when the domain is $\{{}^{-}1, 0, 1\}$?**

F $\{{}^{-}1, 2\}$

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

H $\{1, 2, 4\}$

J $\{{}^{-}4, {}^{-}1, 2\}$

GO ON

39 Which of the following does *not* represent a function of x?

A

x	1	1	1	1
y	1	2	3	4

B

x	1	2	3	4
y	1	1	1	1

C

x	1	2	3	4
y	2	2	4	5

D

x	0	2	5	3
y	7	3	0	2

40 Which is a zero of the function

$$f(x) = x^2 + 6x - 7?$$

F -7

G -6

H 7

J 41

41 Jill was looking at a picture of herself and 3 friends. She measured the height of her image as 10 centimeters. If Jill is actually 60 inches tall, which equation can she use to find h, the actual height in inches, of one of her friends who is c centimeters tall in the picture?

A $h = 10c$

B $h = 6c$

C $h = \frac{5}{3}c$

D $h = \frac{1}{6}c$

42 The gas pressure in a chamber varies directly with the temperature in the chamber. If the pressure in the chamber is 150 atmospheres (atm) when the chamber is at 50°F, what is the pressure in the chamber when the temperature of the chamber is 75°F?

F 175 atm

G 200 atm

H 225 atm

J 275 atm

GO ON

43 $\begin{bmatrix} 3 & 7 \\ 4 & 6 \end{bmatrix} - \begin{bmatrix} -8 & 2 \\ 6 & -2 \end{bmatrix}$

is equal to which matrix?

A $\begin{bmatrix} 0 & 5 \\ -2 & 4 \end{bmatrix}$

B $\begin{bmatrix} 11 & 5 \\ -2 & 8 \end{bmatrix}$

C $\begin{bmatrix} -9 & 12 \\ 24 & -12 \end{bmatrix}$

D $\begin{bmatrix} 6 & -5 \\ 2 & 4 \end{bmatrix}$

44 The number of car sales for May 2000 at Auto One are:

	Compacts	Sport UV	Luxury
Bob	**14**	**8**	**6**
Carol	**7**	**13**	**1**
Blanca	**12**	**10**	**8**

If the sales people get a $200 commission on any car they sell, which matrix shows the amount in commissions each earns?

F

	Compacts	Sport UV	Luxury
Bob	2,800	1,600	1,200
Carol	1,400	2,600	200
Blanca	2,400	2,000	1,600

G

	Compacts	Sport UV	Luxury
Bob	214	208	206
Carol	207	213	211
Blanca	212	210	208

H

	Compacts	Sport UV	Luxury
Bob	186	192	194
Carol	193	187	199
Blanca	188	190	192

J

	Compacts	Sport UV	Luxury
Bob	1,600	1,000	800
Carol	900	1,500	300
Blanca	1,400	1,200	1,000

GO ON

45 $D = \begin{bmatrix} 0 & 2 \\ 1 & -3 \\ 5 & 4 \end{bmatrix}$

$-2D = ?$

A $\begin{bmatrix} 0 & -4 \\ -2 & 6 \\ -10 & -8 \end{bmatrix}$

B $\begin{bmatrix} -2 & 0 \\ -1 & -5 \\ 3 & 2 \end{bmatrix}$

C $\begin{bmatrix} -2 & -4 \\ -2 & 6 \\ -10 & -8 \end{bmatrix}$

D $\begin{bmatrix} 0 & 2 \\ -2 & 6 \\ -10 & 8 \end{bmatrix}$

46 Barry's daily grades for one grading period are shown below.

94, 88, 87, 92, 78, 88, 93, 100, 92, 90, 92, 85

What was the mode of his daily grades?

F 93
G 92
H 91
J 90

47 The stem-and-leaf plot shows the results of a science experiment in which 12 plants were each given a different combination of water and nutrients over a period of time and their growth in millimeters measured.

Millimeters Growth

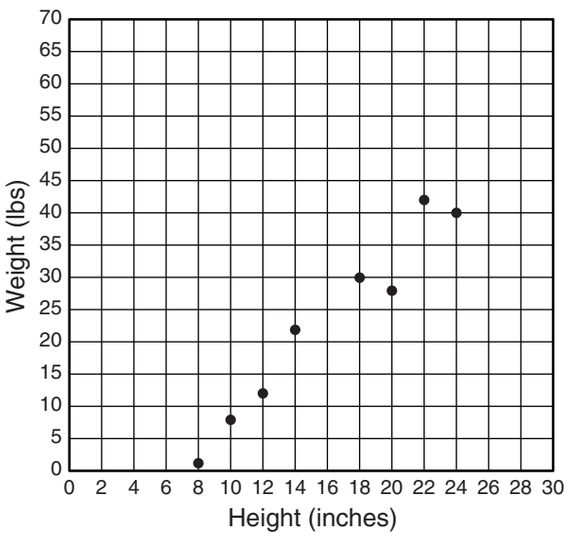
0	8
1	2,4,4,4,5,7,8
2	2,4,6
3	1

What was the median number of millimeters of growth?

A 14
B 15
C 16
D 17

GO ON

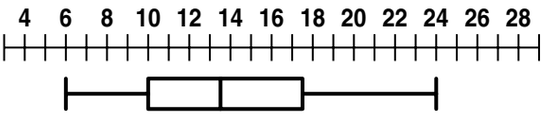
48 **Connie made a scatterplot comparing the shoulder heights of her friends' dogs to their weights. Connie's dog stands 28 inches to his shoulder.**



Using a line of best fit for the plot, which is the best prediction for her dog's weight?

F 40 pounds
G 55 pounds
H 65 pounds
J 70 pounds

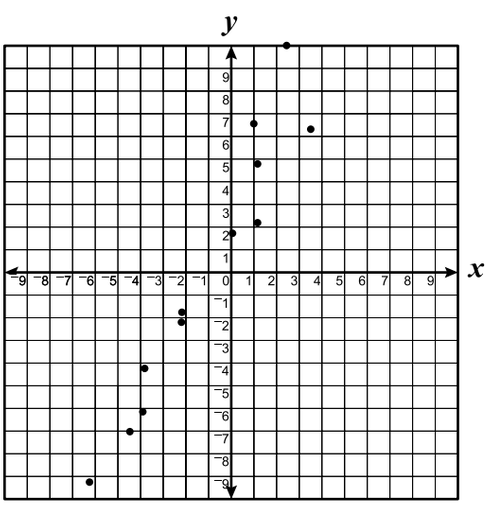
49 **Scott made a box-and-whisker graph of the soccer goals made by the players in his district.**



What is the range of the goals made by the players?

A 24
B 18
C 6
D 4

50



Which equation best represents the data shown in the scatterplot?

F $y = 2x - 2$

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

H $y = 2x + 2$

J $y = x - 1$

STOP