1. Bob designed a computer program so that when a number is entered into the program (input), the computer will generate a new number (output). The chart below shows the input and output of the first four numbers Bob entered.

Input (*x*)	Output (*y*)
1	1
2	3
3	5
4	7

What number will the computer generate when Bob enters the number 40?

A 77
B 78
C 79
D 80

2. The values in the table below were generated using a rule.

x	*y*
0	23
1	30
2	37
3	44
4	51
5	58

Which rule could have been used to generate the values in the table?

A $y = 7x + 23$
B $y = 23x$
C $y = x + 23$
D $y = 7 + 23x$

3. The graph below shows how much Connor earns each week.

Connor's Earnings
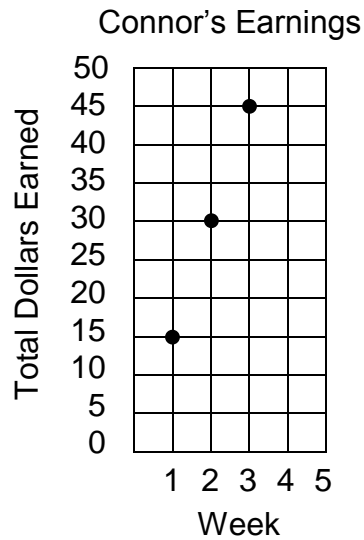
The pattern continues. How much will Connor have earned after his eleventh week?

A $ 60
B $165
C $180
D $330

4. Three linear equations are shown below.

$$y_1 = -2x - 5$$
$$y_2 = -\frac{1}{2}x - 5$$
$$y_3 = 3x - 5$$

Which statement about the three linear equations is incorrect?

A   All three equations have the same slope.
B   Equations y_1 and y_2 have negative slopes.
C   All three equations have the same y-intercept.
D   Equations y_2 and y_3 have the same y-intercept.

5. Frank wrote the first 5 numbers of the pattern shown below.

$$11, 15, 19, 23, 27$$

What is the twentieth number in the pattern?

A   31
B   47
C   87
D   108

6. Ada charges a flat rate of $75 for staining a deck plus an additional $6 for each hour she works. Which expression below best describes the total amount of money Ada charges for staining a deck in x hours?

A $75 + 6x$
B $75 \times 6x$
C $75x + 6$
D $81x$

7. The table below shows a relationship between the values of x and y.

x	y
-7	-10
-2	-5
3	0
8	5

Which equation describes the relationship?

A $y = x - 3$
B $y = x + 3$
C $y = -x - 3$
D $y = -x + 3$

8. Joe is creating a number pattern. He begins the pattern with the number 3. Each number after 3 is twice the number before it, plus 1. Which pattern fits Joe's rule?

A   3, 6, 9, 12, 15
B   3, 6, 13, 27, 55
C   3, 7, 14, 28, 56
D   3, 7, 15, 31, 63

9. Which statement is true?

A   All vertical lines have a slope of zero.
B   All vertical lines have a positive slope.
C   All vertical lines have a negative slope.
D   All vertical lines have an undefined slope.

10. 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

11.   What equation is the rule for the function illustrated by the table of values?

x	-2	-1	0	1	2
y	-4	-1	2	5	8

A $y = -3x + 2$
B $y = 3x + 2$
C $y = 2x$
D $y = -2x$

12.   Which situation is best represented by the graph?

A   the height of a person growing from child to adult
B   the amount of gasoline in a car tank, from fill-up to empty
C   the altitude of a plane during a trip, from take-off to landing
D   the temperature of a pizza after it has been taken out of the oven

13.   The expression shown below describes a sequence of numbers.

$$2n + 3$$

If *n* represents the position of a number in this sequence, which sequence of numbers does this expression describe?

A   5, 8, 11, 14, 17, . . .
B   5, 7, 9, 11, 13, . . .
C   2, 3, 5, 8, 13, 21, . . .
D   2, 5, 8, 11, 14, . . .

14. Which statement best represents the pattern of sales of black-and-white TVs as shown in the graph below?
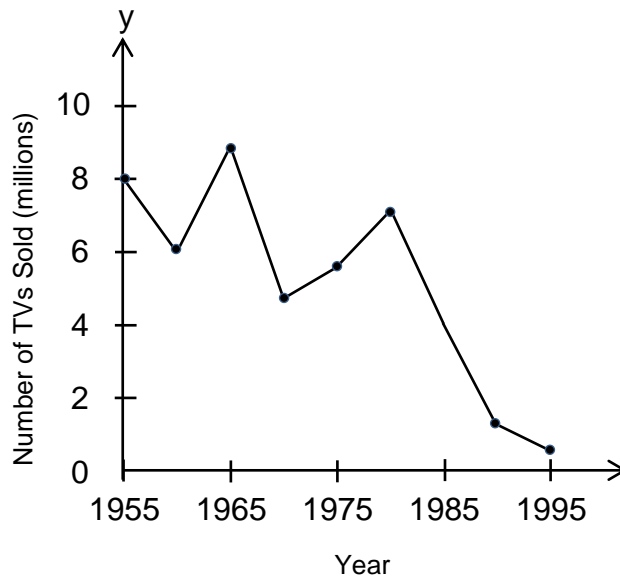
A   The final decline of sales for black-and-white TVs began in 1980.
B   The sales of black-and-white TVs continually decline for 40 years.
C   The most drastic decline in black-and-white TV sales was from 1955–1960.
D   There was a slight decrease in black-and-white TV sales between 1970–1975.

15. The relationship of the values in the table is based on which rule?

x	y
1	-1
3	5
5	11
7	17

A $x - 2 = y$
B $x - 2 = y$
C $2x - 1 = y$
D $3x - 4 = y$

16. Look at the table below.

Student	Height	Long Jump Distance
1	63	60
2	65	68
3	59	57
4	65	61
5	61	54
6	62	60
7	64	59
8	63	66
9	66	68
10	68	74

Which type of display would be most appropriate to illustrate the distance a person can long jump and his/her height?

A   scatter plot
B   circle graph
C   Venn diagram
D   box-and-whisker plot

17. What is the value of y for the equation shown when $x = -8$?

$$y = -1.5x - 7$$

A   −10
B   −19
C   −22.5
D   −44

18. Amahl does computer repairs in his home. He charges a set fee to analyze the problem, plus an hourly rate for his labor. The table below shows C, the total charge to his customer, based on h, the number of hours of labor required.

Number of hours (h)	Total Charge (C)
2	$39
4	$63
6	$87

Which equation could Amahl use to determine his customer's total charge?

A $C = 9h + 21$
B $C = 12h + 15$
C $C = 15h + 9$
D $C = 24h + 15$

19. Some ordered pairs for a linear function of x are given in the table below.

x	y
1	1
3	7
5	13
7	19

Which of the following equations was used to generate the table above?

A $y = 2x + 1$
B $y = 2x - 1$
C $y = 3x - 2$
D $y = 4x - 3$

20. The data in the table show the cost of renting a bicycle by the hour, including a deposit.

Renting a Bicycle

Hours (h)	Cost in Dollars (c)
2	15
5	30
8	45

If hours, h, were graphed on the horizontal axis and cost, c, were graphed on the vertical axis, what would be the equation of a line that fits the data?

A $\quad c = 5h$

B $\quad c = \frac{1}{5}h + 5$

C $\quad c = 5h + 5$

D $\quad c = 5h - 5$

21. The table below shows the value of the first five terms in a sequence. Which expression can be used to find the value of the nth term?

Position	Value of Term
1	13
2	8
3	3
4	-2
5	-7
n	?

A $\quad 5n - 2$

B $\quad 23 - 6n$

C $\quad 15 - 2n$

D $\quad 18 - 5n$

22. Which equation best represents the relationship between x and y in the table below?

x	y
8	1
12	3
18	6
20	7

A $\quad y = \dfrac{1}{2}x - 3$

B $\quad y = \dfrac{1}{2}x - 6$

C $\quad x = 2y - 6$

D $\quad x = 2y - 3$

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

A

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

B

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

C

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

D

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

24. The graph of the equation $y = \frac{3}{4}x - 2$ is shown below.
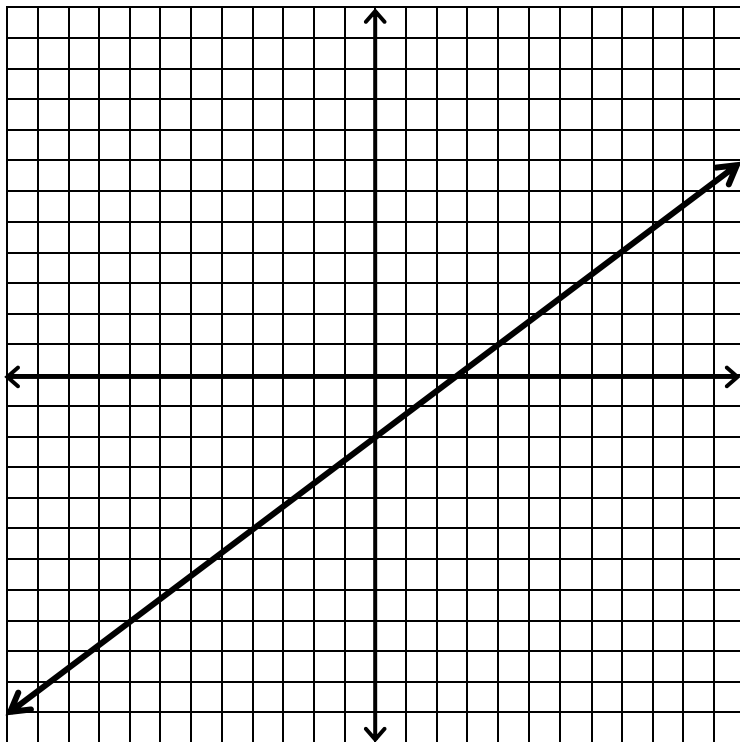
Which table of values best represents ordered pairs on the graphed equation?

A

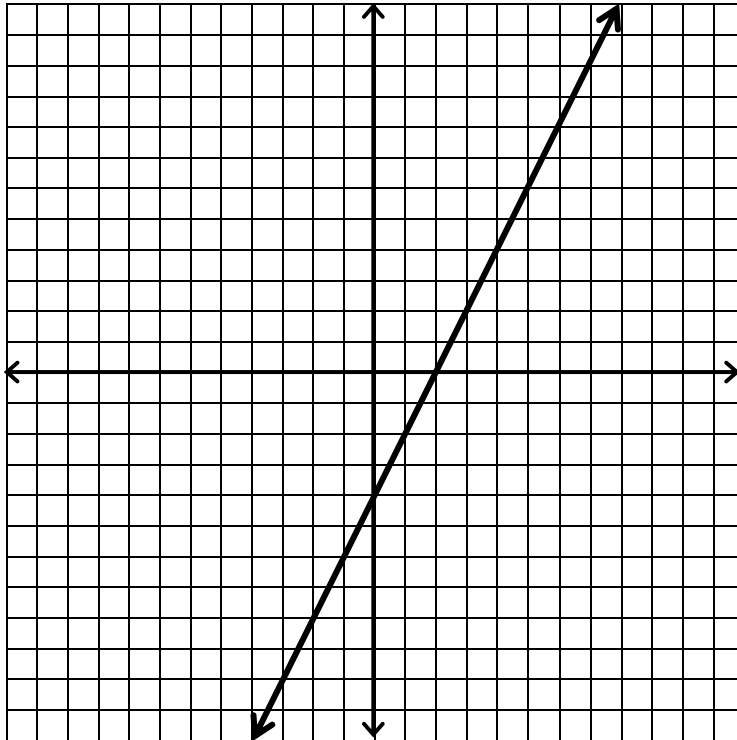| x	y
-8	-8
0	-2
4	1

C

x	y
0	-2
1	4
8	4

B

x	y
-4	-5
4	1
8	5

D

x	y
-4	-5
0	-2
4	1

25.

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

A

x	y
0	4
2	0
4	4
6	8

C

x	y
0	-4
1	-2
2	0
3	3

B

x	y
0	-4
1	0
2	4
3	8

D

x	y
0	-4
2	0
4	4
6	8

26.

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
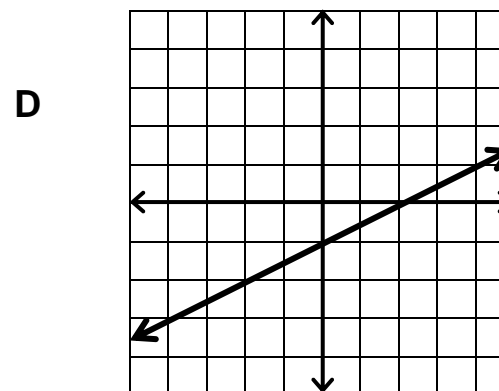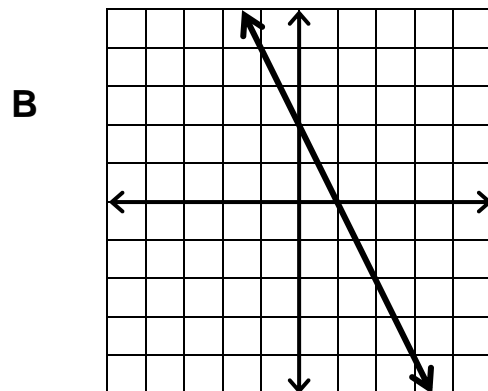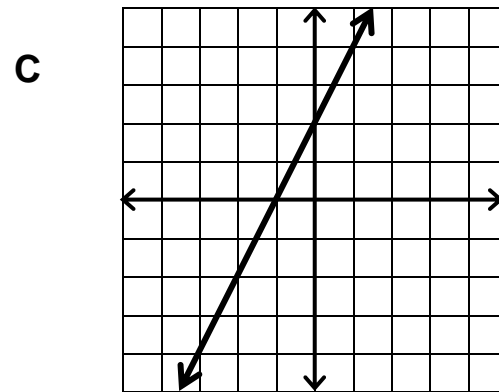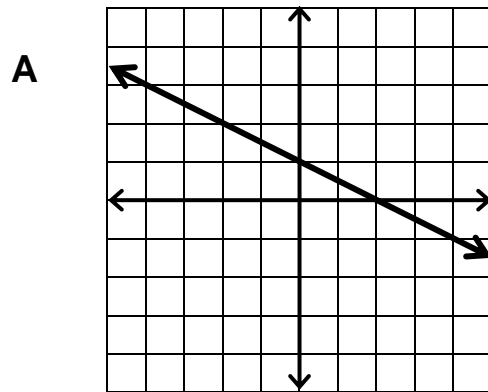
27. Which table could be used to graph the following?

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

A

x	y
-3	6
0	7
3	8
6	9

C

x	y
-3	4
0	7
3	10
6	13

B

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

D

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

28.

x	y
0	-1
2	3
3	5
4	7

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

A $y = \dfrac{x-1}{2}$

B $y = 2x - 1$

C $y = x - 1$

D $y = x + 1$

29.   A phone company charges 25 cents for each call plus 5 cents per minute.

Phone Calls

Minutes (*t*)	Price (*c*) in cents
0	25
1	30
2	35
3	40

Which number sentence shows the relationship between the number of minutes (*t*) and the price (*c*), in cents?

A $c = 25t + 20$
B $c = 8t + 40$
C $c = 20 + 5t$
D $c = 5t + 25$

30. The coordinates in the table below were found using a linear equation.

x	y
1	5
2	8
3	11

Which linear equation could be used to find the coordinates in the table?

A $y = 2x + 3$
B $y = 2x - 3$
C $y = 3x + 2$
D $y = 3x - 2$

31. The table below shows a relationship between the values of x and y.

x	y
-5	-9
-2	-6
1	-3
2	-2
4	0

Which equation describes the relationship?

A $y = -2x - 1$
B $y = -x + 4$
C $y = x - 4$
D $y = 2x - 5$

32. The table below shows the numbers of cups of mix and water Rodney uses to make different amounts of lemonade.
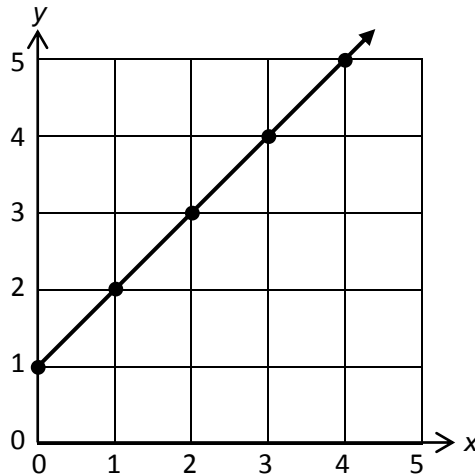
Lemonade Batches

Cups of Mix (*m*)	1	2	3	4	8	10	12	14
Cups of Water (*w*)	3	6	9	12	24			42

Complete the table with the missing cups of water Rodney uses to make the lemonade.

Write an equation to describe the relationship between the amount of mix (*m*) and water (*w*) Rodney uses to make lemonade.

33. Which equation best describes the relationship shown in the graph?

A $y = x + 1$

B $y = x - 1$

C $y = 2x$

D $y = \dfrac{x}{2}$