Name: _____ **Date:** _____

Algebra I EOC (2002)

1) The table shows a set of values for x and y.

x	-2	-1	1	3	4
y	-7	-4	2	8	11

Which equation best represents this set of data?

A) $y = x - 5$
B) $y = x + 3$
C) $y = 3x - 1$
D) $y = -x - 5$
E) $y = -3x + 1$

2) The area of a triangle is given by the equation

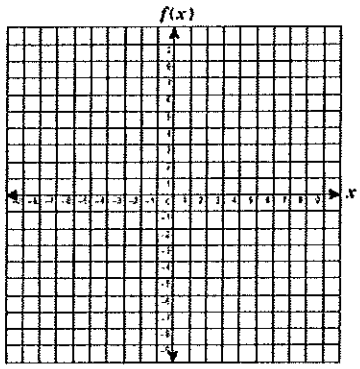
$$h^2 - 6h = 72$$

where h is the height of the triangle. What is the value of h?

F) 6
G) 8
H) 9
J) 12
K) 24

3) Which function includes all of the ordered pairs in the table?

x	-2	-1	0	1	2
$f(x)$	9	3	1	3	9



A) $f(x) = x + 4$
B) $f(x) = x^2 + 1$
C) $f(x) = 2x^2 + 1$
D) $f(x) = -x^2 + 2$
E) $f(x) = -x + 3$

4) Which equation describes the data in the table?

x	y
-3	5
-2	4
1	1
4	-2

F) $2x + y = -1$
G) $x + y = 2$
H) $x - y = -2$
J) $x - y = -6$
K) $2x - y = 1$

5) The equations of 2 lines are shown below.

$$2x - 4y = 6$$

$$3x + y = -5$$

What are the coordinates of the point of intersection?

$2x-4y=6$
$+4(3x+y=-5)$

A) (-1, -8)
B) (-3, -3)
C) (-1, -1)
D) (1, -1)
E) (-1, -2)

$3(-1)+y=-5$
$-3 \quad +3$
$+3$
-2

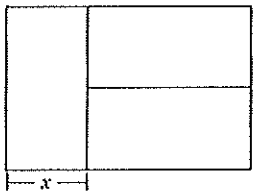
$2x-4y=6$
$+12x+4y=-20$
$\frac{14x}{14} = \frac{-14}{14}$
$x=-1$

6) At which points does the graph of $f(x) = x^2 + 3x - 18$ intersect the x-axis?

F) (-9, 0) and (2, 0)
G) (-6, 0) and (-3, 0)
H) (-6, 0) and (3, 0)
J) (-3, 0) and (6, 0)
K) (-2, 0) and (9, 0)

$y=(x-3)(x+6)$
$x=3 \quad x=-6$

7) A landscaping company uses this layout in many different sizes when planting flowers in a rectangular plot. A different kind of flower is planted in each section. The dimensions of each section are in the ratio of 2:1.



The table below describes y, the area of one rectangular section in square units, as a function of x, the width of the section.

Width of Section, x	1	2	3	4	5
Area of Section, y	2	8	18	32	50

Which equation describes this functional relationship?

A) $y = 6x^2$
B) $y = 2x^2$
C) $y = \frac{2}{3}x^2$
D) $y = \frac{1}{2}x^2$
E) $y = \frac{1}{3}x^2$

8) If $x = n^3$, which expression is equal to n^{12}?

F) x^3
G) x^4
H) x^7
J) x^9
K) x^{15}

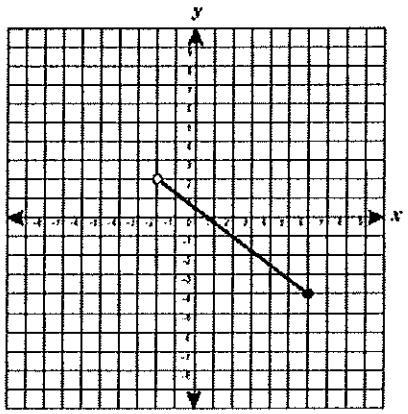
$(x)^4 = (n^3)^4$

9) Which equation describes the data in the table?

x	y
−8	−7
−2	−4
2	−2
4	−1

A) $y = 2x - 1$
B) $y = -x + 3$
C) $y = \frac{1}{2}x - 3$
D) $y = x + 1$
E) $y = -\frac{1}{2}x - 1$

10) What is the domain of the function shown on the graph?



F) $-2 < y \leq 2$
G) $-4 \leq x \leq 6$
H) $-4 < y \leq 2$
J) $-2 < x \leq 6$
K) $-2 \leq x \leq 2$

$-2 < x \leq 6$

11) What is the value of x in the following equation?

$$3x - 4(x + 1) + 10 = 0$$

A) 2
B) 6
C) 10
D) 11
E) 14

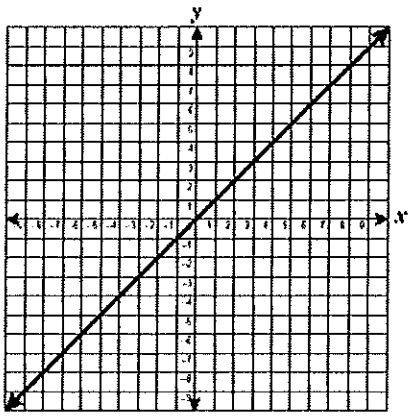
$3x - 4x - 4 + 10$

$-x + 6 = 0$

$+x \quad +x$

$6 = x$

12) Which function is best represented by the graph below?



F) $y = \frac{1}{2}x - 1$
G) $y = -x$
H) $y = x^2$
J) $y = x$
K) $y = \frac{1}{2}x + 1$

13) The circumference of a circular rug is about 31.4 feet, and its area is about 78.5 square feet. What is the approximate radius of the rug?

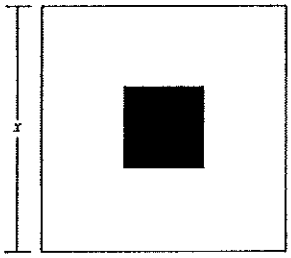
$C = \pi d$

$\frac{31.4}{3.14} = \frac{3.14d}{3.14}$

$10 = d$

A) 3.5 ft
B) 5 ft
C) 7 ft
D) 9 ft
E) 10 ft

14) A flag company makes storm-signal flags in multiple sizes. The square flag design is used to warn small craft of wind speeds above 38 miles per hour. The length of the side of the flag is always 3 times the length of the side of the black square.



The table below describes y, the area of the black square in square units, as a function of x, the length of the flag's side.

Length of Side, x	1.5	3	6	9	12
Black Area, y	0.25	1	4	9	16

Which equation describes this functional relationship?

F) $y = 3x^2$
G) $y = 9x^2$
H) $y = x^2 - 9$
J) $y = \frac{1}{3}x^2$
K) $y = \frac{1}{9}x^2$

15) Tanya keeps a record of her weekly earnings. Last week she worked a total of 6 hours and earned \$51. This week she worked a total of 9 hours and earned \$76.50. Which equation can be used to find $f(x)$, the amount she would earn at this rate if she worked x hours?

$6h = 51$

$9h = 76.50$

A) $f(x) = \frac{2}{17}x$
B) $f(x) = \frac{2}{3}x$
C) $f(x) = 1.5x$
D) $f(x) = 8.5x$
E) $f(x) = 12.75x$

16) Eduardo's bowling scores for his first 3 games were 145, 136, and 156. If he wants to have an average score of x after 4 games, which equation describes s, the score he needs for his fourth game?

F) $x = \dfrac{145+136+156}{s}$

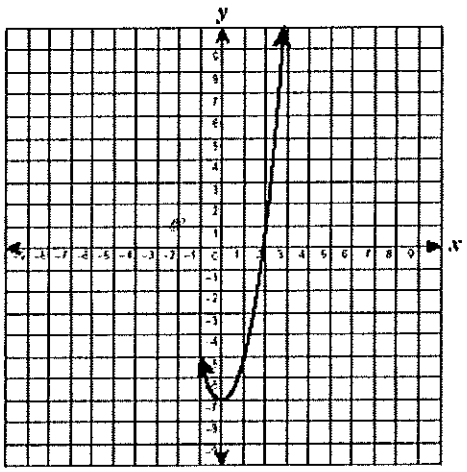
G) $x = \dfrac{145+136+156}{3} + s$

H) $x = \dfrac{145+136+156+s}{4}$

J) $x = \dfrac{145+136+156+s}{3}$

K) $x = \dfrac{145+136+156}{4} + s$

17) A portion of the graph of the function $y = 2x^2 - 7$ is shown on the grid below.



For which other value of x does y equal 1?

A) -1
B) -2
C) -3
D) -4
E) -5

18) Which equation represents the line that passes through the points (6,1) and (-2,-3)?

F) $y = \frac{1}{2}x + 4$

G) $y = \frac{1}{2}x + 2$

H) $y = \frac{1}{2}x - 2$

J) $y = 2x - 1$

K) $y = 2x - 11$

$\frac{1-(-3)}{6-(-2)} = \frac{4}{8} = \frac{1}{2}$

$y - 1 = \frac{1}{2}(x - 6)$

$y - 1 = \frac{1}{2}x - 3$

$+1 \quad +1$

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

19) To convert a temperature in degrees Fahrenheit, F, to a temperature in degrees Celsius, C, the following formula can be used.

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

What is the minimum value of F that will make C greater than or equal to 70?

A) 68.4

B) 94

C) 126

D) 158

E) 183.6

$C \geq 70$

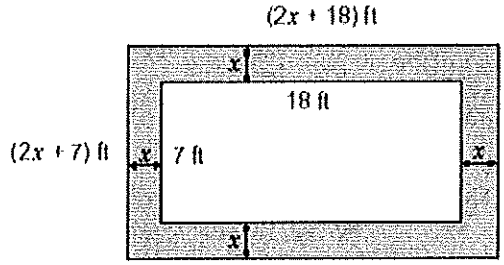
$\frac{9}{5} \cdot \frac{5}{9}(F - 32) \geq 70 \cdot \frac{9}{5}$

$F - 32 \geq 126$

$+32 \quad +32$

$F \geq 158$

20) Mrs. Mora wants to put a sidewalk around a rectangular garden. The garden is 7 feet wide and 18 feet long. The sidewalk will be the same width all the way around the garden.



The area of the sidewalk will be 150 square feet. What will be the sidewalk's width, x?

F) 2.5 ft

G) 3.5 ft

H) 5 ft

J) 5.5 ft

K) Not Here

$(2x+18)(2x+7) - 18(7) = 150$

$4x^2 + 14x + 36x + 126 - 126 = 150$

$4x^2 + 50x = 150$ $\quad 4x^2 + 50x - 150$

$2(2x^2 + 25x - 75)$

$5 \quad 30$

$b = 25$

$ac = -150$

$(x+15)(2x-5) = 0$

$x = -15 \quad \frac{2x}{2} = \frac{5}{2}$

$x = 2.5$

	$2x$	-5
x	$2x^2$	$-5x$
15	$30x$	-75

21) The height of a ball that was batted into the air at 160 feet per second is a function of t, the time in seconds after the ball was hit. The height is determined by subtracting 16 times the square of t from 160 times t. Which equation can be used to find t when the ball is 400 feet high?

A) $160t - 16t^2 = 400$
B) $(160 - 16)t^2 = 400$
C) $160(t^2 - t) = 400$
D) $160 - (16 - t^2) = 400$
E) $16t^2 - 160t = 400$

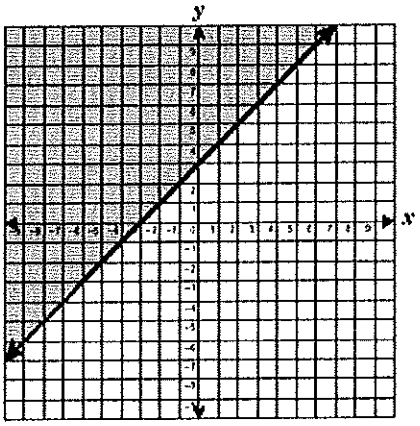
$160t - 16t^2 = 400$

22) Wayne cut a 60-inch wire into 3 pieces. The longest piece was twice as long as each of the other 2 pieces, which were the same length. What was the length of the longest piece of wire?

F) 15 in.
G) 20 in.
H) 24 in.
J) 30 in.
K) 40 in.

$4x = 60$
$x = 15$

23) Which inequality best describes the graph below?



A) $x - y \leq 3$
B) $x + y \leq -3$
C) $x + y \geq -3$
D) $x - y \geq 3$
E) $x - y \leq -3$
$0 - 4 \leq -3$

$y \geq x + 3$
$y - x \geq 3$
$-y + x \leq -3$

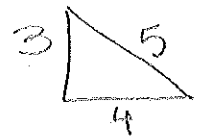
24) Mohammed earns \$650 per month plus an 8% commission of his sales. If he sold x dollars of merchandise last month, which equation can be used to find y, his total earnings last month?

F) $y = x + 0.08x$
G) $y = (650 + 0.08)x$
H) $y = 0.08(650 + x)$
J) $y = 650 + 0.08x$
K) $y = 0.08(650) + x$

$650 + .08x$

25) Andrew wants to put a fence around a corner of his property. He has 320 feet of fencing and plans to use at least ½ of it. The fenced area will be shaped like a right triangle with sides in the ratio of 3:4:5. Which range describes the length of the shortest side of the triangle?

A) Less than 40 ft
B) From 40 ft to 80 ft
C) From 85 ft to 125 ft
D) From 130 ft to 170 ft
E) More than 170 ft

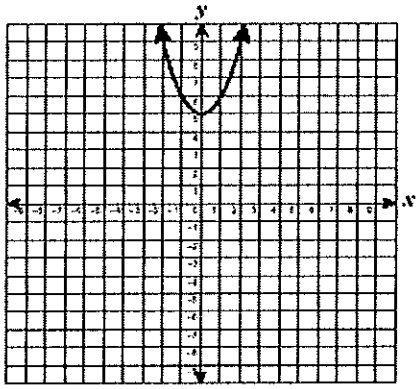


P=12 320 ×27

13

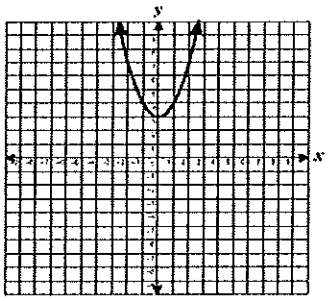
3x

26) The graph of the function $y = x^2 + 5$ is shown below.

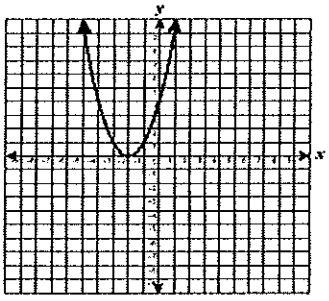


Which graph best represents the function $y = x^2 - 2$?

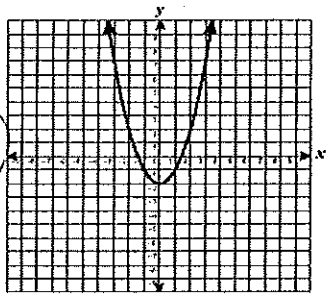
F



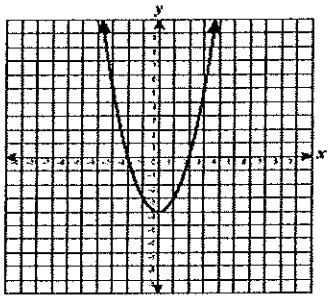
G



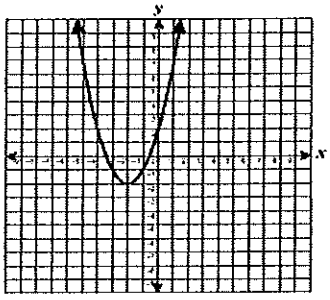
H



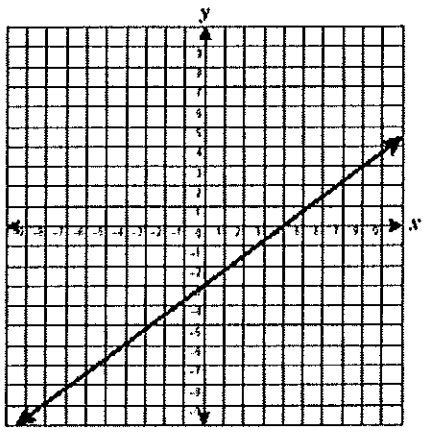
J



K



27) What is the x-intercept of the function graphed below?



Record your answer: (4, 0)

28) What is the y-intercept of the function $2x + 3y = -36$?

Record your answer: (0, -12)

$2x + 3y = -36$

$-2x \quad -2x$

$3y = -2x - 36$

$\frac{3y}{3} = \frac{-2x - 36}{3}$

$y = \frac{-2}{3}x - 12$

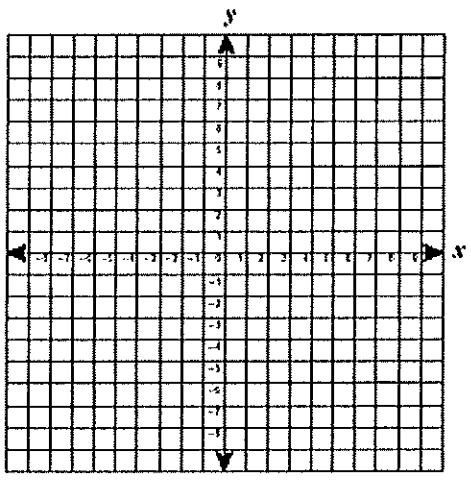
29) What is the value of y if x is -2?

$y = \frac{x^5}{x^2} = x^3$

$y = (-2)^3$

A) -10
B) -8
C) -6
D) 2.5
E) Not Here

30) The graph of line p has x-intercept (-3, 0) and y-intercept (0, -6). The graph of line q has a slope of 1 and crosses the origin. Which coordinate pair names the point at which lines p and q intersect?



F) (0, -2)
G) (-2, 0)
H) (-2, -2)
J) (-3, 0)
K) (-6, 0)

(-3, 0) (0, -6)

$\frac{-6}{3} = -2$

$y = -2x - 6$

$y = x$

31) Fredric wants to put a total of at least x stamps in 3 albums. If he puts 44 stamps in the first album and 45 in the second album, which inequality describes s, the number of stamps he should put in the third album?

A) $44+45+s \geq \frac{x}{3}$

B) $s-(44+45) \geq x$

C) $(44)(45)(s) \geq x$

D) $\frac{44+45+s}{3} \leq x$

E) $44+45+s \geq x$

$44+45+s \geq x$

32) Which function best describes the data given in the table?

x	$f(x)$
1	3
2	9
3	27
4	81
5	243
6	729

F) $f(x)=\frac{1}{3}x^2$

G) $f(x)=3^{-x}$

H) $f(x)=3x^2$

J) $f(x)=3^x$

K) $f(x)=-3^x$

33) Yesterday a total of 24 students were present in Alfred's class. There were 3 fewer girls than twice the number of boys. Which system of equations can be used to find g, the number of girls who were present in Alfred's class yesterday, and b, the number of boys who were present?

A) $g+b=24$ ✓
$g=2b-3$ ✓

B) $g+b=24$ ✓
$b=2g-3$

C) $g+b=24$ ✓
$g=2b+3$

D) $g+b=24$ ✓
$b=2g+3$

E) $g=b+24$
$b=2g-3$

$g+b=24$

$2b-3=g$

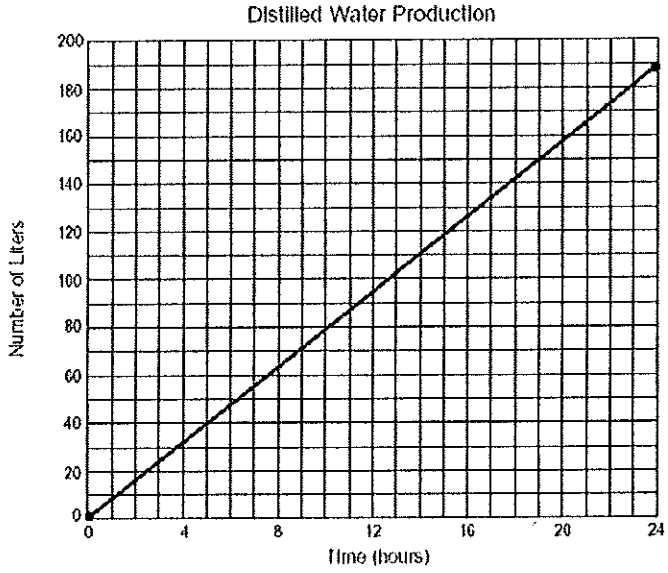
34) The owner of a convenience store recorded the number of customers in the store from 6:00 a.m. to 11:00 a.m. who were served coffee and the number of pots of coffee that were consumed.

Number of Pots of Coffee, p	Number of Customers, c
2	16
3	24
4	32
5	40
7	56

Which equation best describes the relationship between the number of customers who were served coffee and the number of pots of coffee?

F) $c = 5p + 5$
G) $c = 8p$
H) $c = 6p + 3$
J) $c = 6p$
K) $c = 12p - 9$

35) A water distillation machine can produce 189 liters of water during each day of continuous operation. The graph shows the rate at which the machine produces water.



If the machine operates continuously for 3000 hours, what will be the total number of liters of distilled water produced?

A) 11,907 L
B) 23,625 L
C) 47,250 L
D) 70,875 L
E) 72,000 L

36) Ms. Nugent has saved \$325 for a new refrigerator. She plans to save an additional \$50 per month. What is the least number of months she will need to save money in order to have enough to buy a refrigerator that costs \$760, including tax?

$325 + 50x = 760$

$50x = 435$

$x = 8.7$

F) 3 months
G) 7 months
H) 9 months
J) 15 months
K) 22 months

37) The area of a rectangular floor is described by the equation below, where w is the width of the floor in meters. What is the width of the floor?

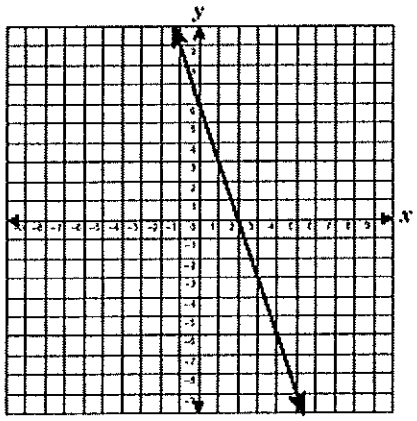
$$w(w-9) = 252$$

$w^2 - 9w - 252 = 0$

$(21, 0)$

A) 12 m
B) 14 m
C) 16 m
D) 21 m
E) 28 m

38) The graph of the function $y = -3x + 6$ is shown below. If the line is translated 3 units down, which function will describe the new line?



F) $y = -3x + 3$
G) $y = -x + 2$
H) $y = -3x - 1$
J) $y = -x + 6$
K) $y = -3x - 3$

39) The area of a rectangle is given by the equation below, where w is the width. What is the width of the rectangle?

$$2w^2 + w = 36$$

$2w^2 + w - 36 = 0$

A) 9
B) 6
C) 4.5
D) 4
E) 3

40) The table shows a set of values for x and y. Which equation best represents this set of data?

x	−3	−2	1	3	6
y	7	5	−1	−5	−11

F) $y = \frac{1}{2}x + 2$
G) $y = -2x + 1$
H) $y = -3x - 2$
J) $y = 2x + 1$
K) $y = \frac{1}{2}x - 2$