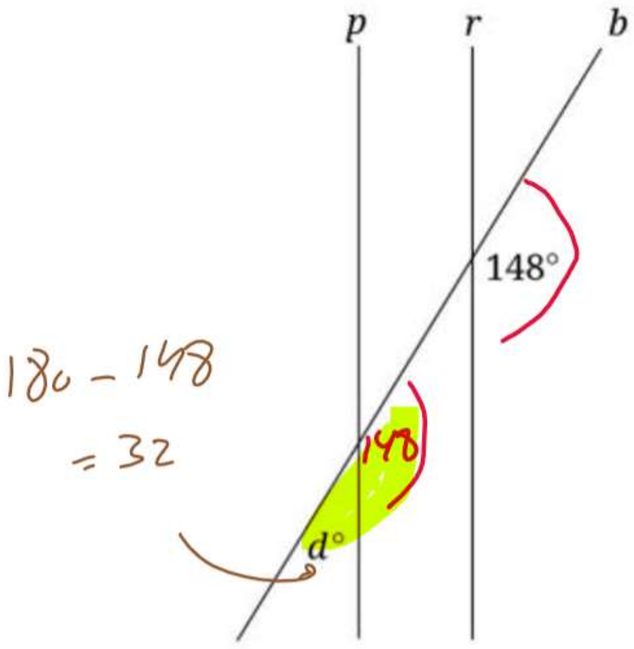
12)



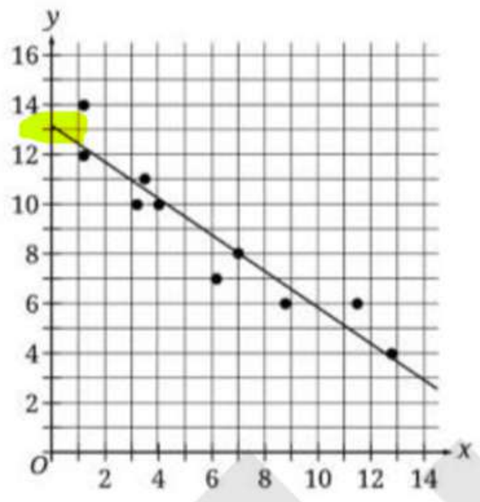
180 − 148
= 32

148

In the figure shown, line b intersects parallel lines p and r. What is the value of d?

a) 16
b) 32
c) 74
d) 148

13)



D

Which of the following equations could define the line of best fit for the scatterplot shown?

A) $y = -13 - 0.7x$
B) $y = -13 + 0.7x$
C) $y = 13 - 0.7x$
D) $y = 13 + 0.7x$

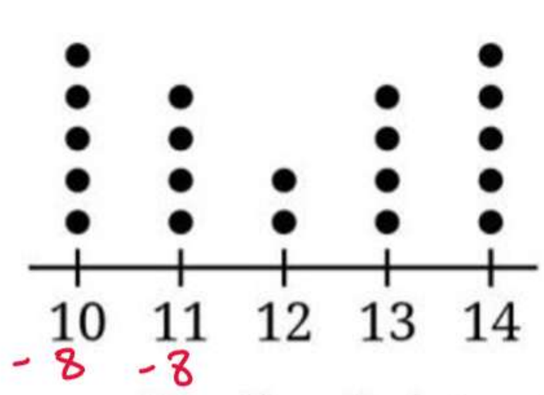
$y = mx + b$
slope
y-int

+ve
-ve
zero
undefined

14)

Range = 14 − 10
= 4

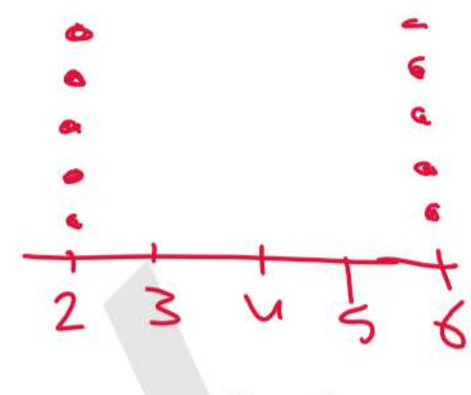
Data Set R



−8 −8

Range = 6 − 2
= 4

S



There are 20 values in data set R, represented by the dot plot shown. Data set S is created by subtracting 8 from each of the values in data set R. Which of the following correctly compares the ranges and the means of data sets R and S?

A) The range of data set S is less than the range of data set R, and the mean of data set S is equal to the mean of data set R.
B) The range of data set S is less than the range of data set R, and the mean of data set S is less than the mean of data set R.
C) The range of data set S is equal to the range of data set R, and the mean of data set S is equal to the mean of data set R.
D) The range of data set S is equal to the range of data set R, and the mean of data set S is less than the mean of data set R.

15) **During a video game session, a player scored a total of 1,000 points for c cooperative missions and s solo missions. The equation 20c + 25s = 1,000 represents this situation. Which of the following is the best interpretation of the number 25 in this context?**

A) The player completed 25 cooperative missions during this session.
B) The player scored 25 points for each cooperative mission during this session.
C) The player completed 25 solo missions during this session.
D) The player scored 25 points for each solo mission during this session.

16)

$g(x) = \frac{\sqrt{x}}{2}$

The function g is defined by the given equation. If $g(x) = 5$, what is the value of x?

a) 10
b) 25
c) 50
d) 100

17)

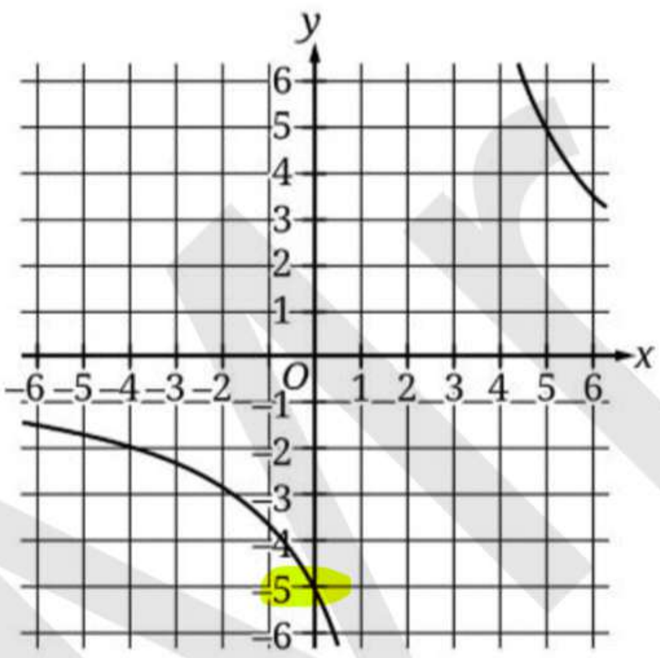
$y = x^2 - 7$

$x = -7$

When graphed in the *xy*-plane, the given equations intersect at the point (x, y). What is the value of y?

(A) −21
(B) −7
(C) 42
(D) 49

18)



A partial graph of $y = f(x)$ in the xy-plane is shown. Which of the following is the value of $f(0)$?

(A) −5
(B) $-\frac{1}{4}$
(C) 0
(D) 5

19)

Which of the following equations defines a line in the *xy*-plane that has a slope of $\frac{1}{6}$ and passes through the point $(12, -7)$?

(A) $y = \frac{x}{6} - 9$
(B) $y = \frac{x}{6} - 7$
(C) $y = -9x + \frac{1}{6}$
(D) $y = 12x - 7$

20) How many distinct real solutions does the equation $4x^2 - 8x - 5 = 0$ have?

(A) Exactly one
(B) Exactly two
(C) Infinitely many
(D) Zero

21) A jar contains a total of 37 red and blue tokens used to play a game. The mass of one red token is 90 grams, and the mass of one blue token is 120 grams. If the combined mass of the tokens is 3,810 grams, how many of the tokens in the jar are blue?

$r + b = 37$

$90r + 120b = 3810$

$r = 21$

$b = 16$

Mode
5
1

(A) 5

(B) 16

(C) 21

(D) 32

22) Circle R is defined by the equation $(x + 3)^2 + y^2 = 64$. If circle S is the result of shifting the graph of circle R to the right 7 units in the xy-plane, what is the equation of circle S?

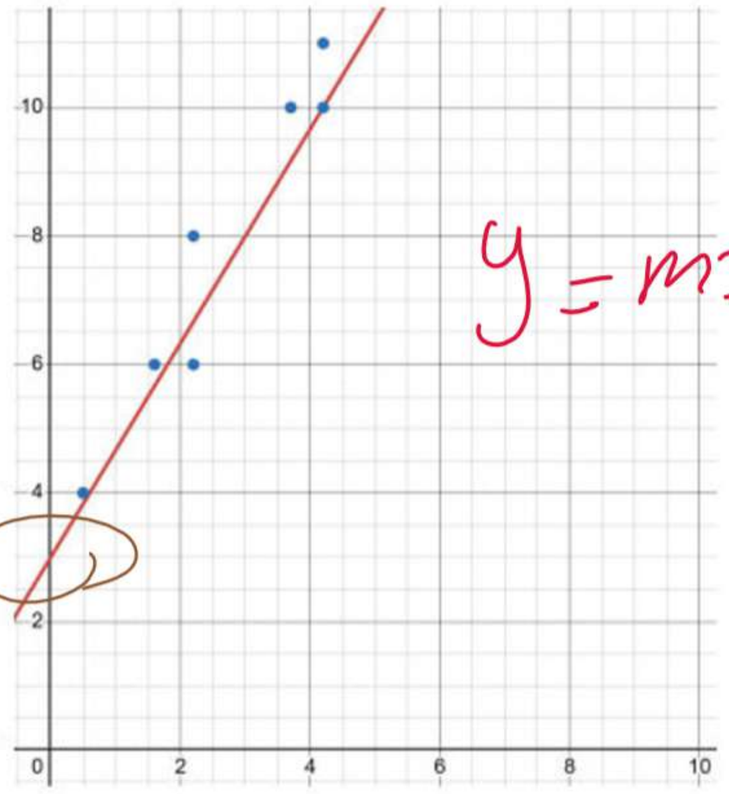
(A) $(x + 3)^2 + (y - 7)^2 = 64$

(B) $(x + 3)^2 + (y + 7)^2 = 64$

(C) $(x - 4)^2 + y^2 = 64$

(D) $(x + 10)^2 + y^2 = 64$

1- The scatterplot shows the relationship between two variables x and y. A line of best fit is also shown. Which of the following equations best represents the line of best fit shown?



A) $y = \frac{5}{3}x + 3$

B) $y = -2x + 1.5$

C) $y = 3x + 1.5$

D) $y = -3x + 1.5$

2- $3x - 4y = 5$

$x = 7$

Which is the solution (x, y) to the given systems of equations?

A) (7, 4)

B) (7, 12)

C) (7, -12)

D) (7, -4)

3- What value of x is the solution to the equation

$20x + 24 = 28x$?

A) $\frac{1}{4}$

B) $\frac{1}{3}$

C) 3

D) 5

4- The function f is defined by

$$f(x) = \frac{7}{10}x + 74$$

What is the value of f (20) ?

The answer is : .....

5- The function f is defined by

$$f(x) = 8 + \sqrt{x}$$

What is the value of f (36) ?

A) 0

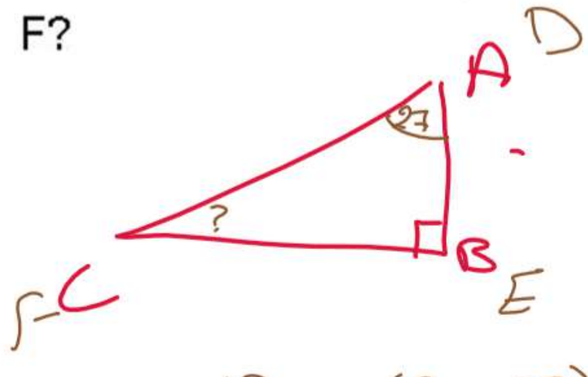
B) 14

C) 17

D) 26

6- Triangles ABC and DEF are congruent, where A corresponds to D and B and E are right angles. The measure of angle A is 27°

What is the measure, in degrees, of angle F?



The answer is : .....

7- At a convention center, there are a total of 325 visitors. Each visitor is located in either room A, room B or room C. If one of these visitors is selected at random, the probability of selecting a visitor who is located in room A is 0.48, and the probability of selecting a visitor who is located in room B is 0.16. How many visitors are located in room C?

A) 25
B) 36
C) 104
D) 117

8- $g(m) = -0.05m + 14.1$

The given function g models the number of gallon:gasoline that remains from a full gas tank in a car after driving m miles. According to the model, about how many gallons of gasoline are used to drive each mile?

A) 0.05
B) 14.1
C) 20
D) 282

9- What is the center of the circle in the xy-plane defined by the equation

$$(x - 9)^2 + (y + 6)^2 = 81$$

A) (-9, -6)
B) (-9, 6)
C) (9, -6)
D) (9, 6)

10- If $2x + 3 = 9$, what is the value of $4x-4$?

The answer is : .....

11- $f(x) = 600(0.7)^x$

A conservation scientist implemented a program to reduce a certain invasive insect population in an area. The given function estimates this insect species' population x years after 2008, where $x \leq 8$. Which of the following is the best interpretation of 6,000 in this context?

A) The estimated percent decrease in the inspect population for this species and area every 8 years after 2008.
B) The estimated percent decrease in the insect population for this species and area each year after 2008.
C) The estimated insect population for this species and area 8 years after 2008.
D) The estimated initial insect population for this species and area in 2008.

12- Line r is defined by the equation $4x - 5y = 8$

line s is parallel to line r in the xy-plane.

What is the slope of line s ?

A) $\frac{5}{4}$
B) $\frac{4}{5}$
C) -4
D) -5

13- The cost to rent a bus from Company X is $750 for the first 2 hours and an additional $50 per hour for each hour after the first 2 hours. If the total cost to rent the bus from Company X for t hours, where $t > 2$. is $1,050. Which equation represents this situation?

A) $750 (t - 2) + 50 t = 1050$

B) $750 (2t) + 50 t = 1050$

C) $750 + 50 (t - 2) = 1050$

D) $750 + 50 (2t) = 1050$

14- $y = -\frac{1}{4}x^2 + x + 28$

The given equation models a company's active projects over 6 months, where y is the estimated number of active projects x months after the end of April 2012, where $0 < x < 6$. Which statement is the best interpretation of the y-intercept of the graph of this equation in the xy -plane?

A) At the end of April 2012, the estimated number of active projects was 0.

B) At the end of April 2012, the estimated number of active projects was 28.

C) At the end of May 2012,the estimated number of active projects was 0.

D) At the end of May 2012,the estimated number of active projects was 28.

15- In right triangle RST, the sum of the measures of angle R and angle S is 90 degrees. The value of $sin(R)$ is $\frac{4\sqrt{2}}{9}$ What is the value cos (S) ?

A) $\frac{4\sqrt{2}}{9}$

B) $\frac{4\sqrt{2}}{7}$

C) $\frac{7\sqrt{2}}{8}$

D) $\frac{9\sqrt{2}}{8}$

16- $19.5x + 29.75y = 394$

Odalys ordered mulch and river rock, which cost a total of $394, for her home. The given equation represents the relationship between the number of cubic yards of mulch, x , and the number of tons of river rock, y. Odalys ordered. How much more,in dollars, did a ton of river rock cost Odalys than a cubic yard of mulch? Enter decimal form only.

The answer is : .....

17- A hemisphere is half of a sphere.If a hemisphere has a radius of 50 inches, which of the following is closest to the volume, in cubic inches , of this hemisphere ?

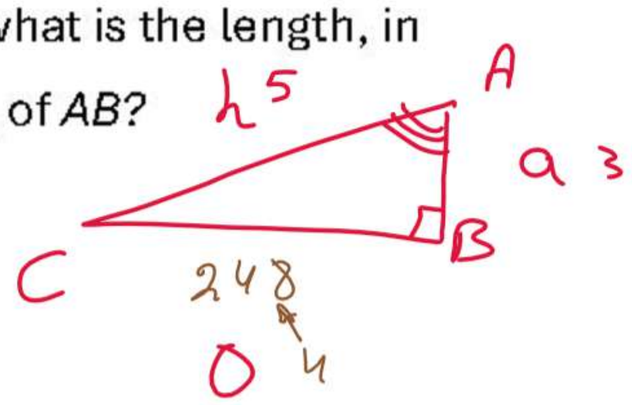
A) 5200

B) 20900

C)196300

D)261800

18- In triangle ABC, angle B is a right angle, and the length of BC is 248 millimeters. If $\cos(A) = \frac{3}{5}$, what is the length, in millimeters, of AB?



A) 62
B) 186
C) 248
D) 310

19- In a certain state, the population of pheasants, a type of bird , is estimated each year by counting the number of pheasants observed along certain roads in the state. On average, each year from 2005 to 2015 the number of pheasants counted per mile of road decreased by 3.5 % of the number of pheasants per mile of road the previous year. Based on this average, if there were 6.97 pheasants per mile of road in this state in 2005, which of the following best approximates the number of pheasants per mile of road in 2015?

A) $0.965\,(6.97)^{10}$
B) $1.035\,(6.97)^{10}$
C) $6.97\,(0.035)^{10}$
D) $6.97\,(0.965)^{10}$

20- To study fluctuations in leaf water potential , samples of wood were taken from 25 trees and cut in the shape of a cube. The length of the edge of one of these cubes is 2.00 centimeters. If this cube has a mass of 2.72 grams, what is the density of this cube, in grams per cubic centimeter? Enter decimal form only.

The answer is : .....

21- The table shows two values of x and their corresponding values of y. The graph of the linear equation representing this relationship passes through the point $(\frac{1}{3}, a)$ What is the value of a?

x	y
-11	-25
9	55

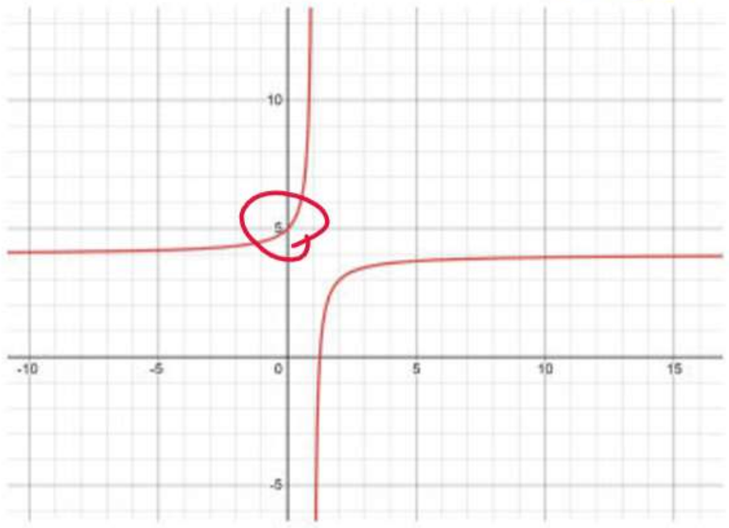
Enter decimal form only and round to two decimal places.

The answer is : .....

22- Which system of linear equations has no solutions ?

A) $-2x + 8y = -5$
$2x - 8y = 5$
B) $2x - 8y = 5$
$3x + 9y = 6$
C) $2x - 8y = 5$
$-6x + 24y = -15$
D) $-2x + 8y = 5$

1- The graph of $y = f(x)$ is shown in the xy-plane. What is the value of f(0)?



The answer is : .....

2- Which expression is equivalent to $(9nr^2 + 3nr) + (6n^2r + 5nr)$

A) $15\,n^2r^2 + 8nr$

B) $15\,n^3r^3 + 8\,n^2r^2$

C) $54\,n^3r^3 + 15\,n^2r^2$

D) $9\,nr^2 + 6n^2r + 8nr$

3- If $\frac{2a}{b} = 5.8$ and $\frac{a}{bn} = 23.2$, what is the value of $\frac{1}{n}$?

The answer is : .....

4- $v = -\frac{w}{161x}$

The given equation relates the distinct positive numbers v, w and z.Which equation correctly expresses w in terms of v and x ?

A) $w = -1161vx$

B) $w = -\frac{161v}{x}$

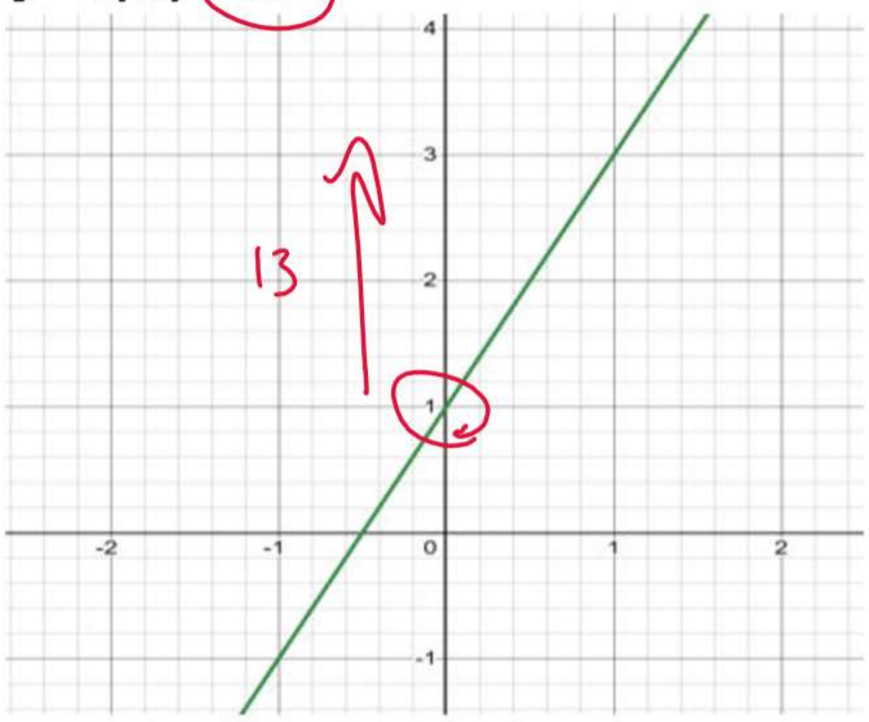
C) $w = -\frac{x}{161v}$

D) $w = v + 161x$

5- A real estate company offers a series of three webinars.1,250 people attended the first webinar. 68 of the people who attended the first webinar attended the second webinar, and 32 of the people who attended the first and second webinars attended the third webinar. How many people attended all three webinars?

The answer is : .....

6- The graph of $y = f(x)$ is shown. What is the y -intercept of the graph of $y = f(x) + 13$?



A) (0, -12)
B) (0, 14)
C) (1, 13)
D) (1, 14)

7- The function f is defined by $f(x) = |x - 6x|$

What value of a satisfies f(7) – f(a) = -15 ?

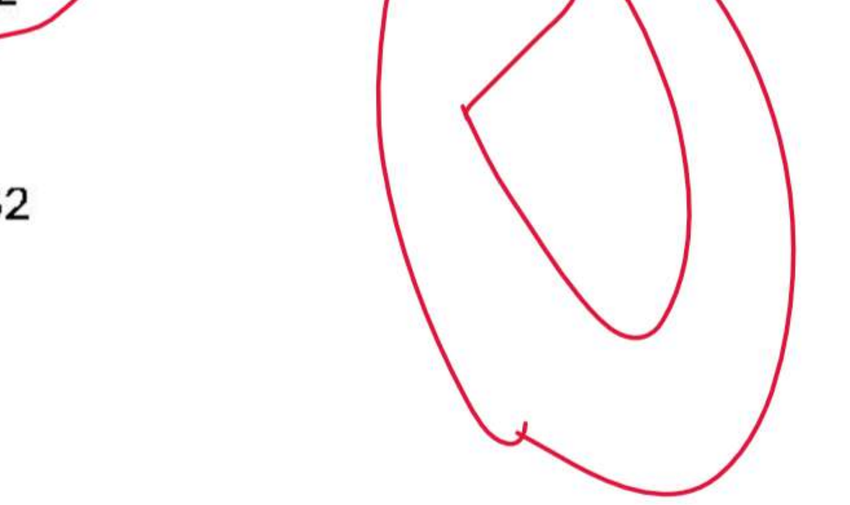
A) – 22
B) 3
C) 10
D) 75

8- If $-9(15 - 3x) + 5 = -10(15 - 3x) + 21$ what is the value of $15 - 3x$?

The answer is : .....

9- The minimum value of x is 11 less than 8 times another number n. Which inequality shows the possible values of x?

A) $X \leq 8n - 11$
B) $X \geq 8n - 11$
C) $X \leq 11 - 8n$
D) $X \geq 11 - 8n$



10- The shaded region shown represents the solutions to the inequality $-18y < c$ where c is a constant. What is the value of c?

A) 162
B) 9
C) -9
D) -162

11- At a constant temperature, a scuba diver combines two different concentrations of nitrox mix *(oxygen — nitrogen gas mixture)* to fill a tank to a total pressure of 130 atmospheres (atm), of which 34 is contributed by oxygen. Nitrox mix *A* contributes x atm of pressure to the tank, of which 22 is contributed by oxygen. Nitrox mix *B* contributes *y atm* of pressure toffiie tank, of which 48 is contributed by oxygen. Which system of equations represents this situation?

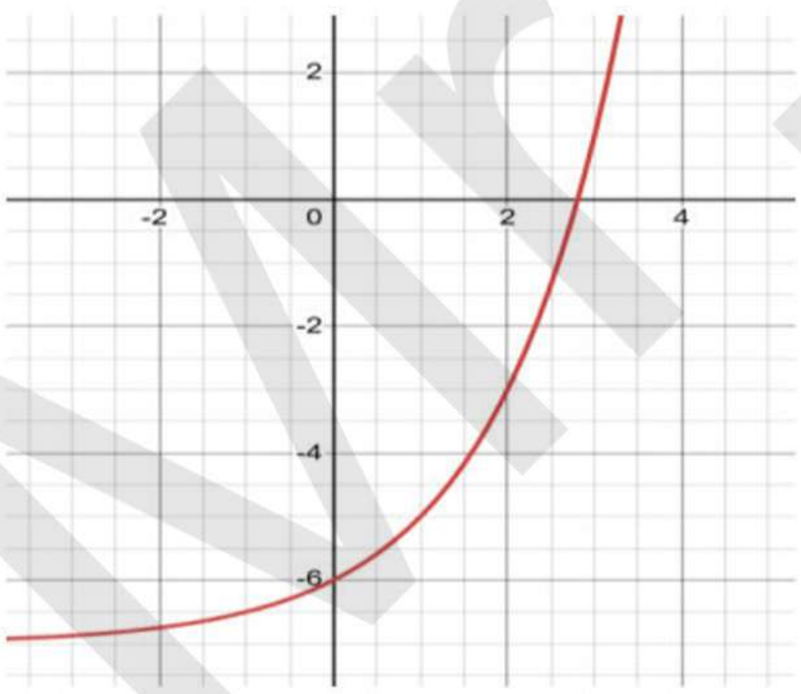
A) $x + y = 130$
$0.48x + 0.22y = 0.34(130)$

B) $x + y = 130$
$0.22x + 0.48y = 0.34(130)$

C) $x + y = 0.34(130)$
$0.48x + 0.22y = 130$

D) $x + y = 0.34(130)$
$0.22x + 0.48y = 130$

12- The graph of the equation $y = 2^x + k$



A) -7
B) -6
C) -5
D) -4

13- A certain town has an area of 3.99 s miles. What is the area, in square yards, of this town (1*mile* = 1,760 *yards)*?

A) 441
B) 7,022
C) 776,341
D) 12,359.424

14- The function f is defined by $f(x) = 4x^2$ What is the value of f(11)?

A) 44
B) 52
C) 88
D) 484

15- The function f gives the product of a number,x, and a number that is 66 more than Which equation defines f?

A) $f(x) = x^2 + x + 66$
B) $f(x) = x^2 + 66$
C) $f(x) = x^2 + 66x$
D) $f(x) = x^2 + 66x + 66$

16- One of the factors of $4x^3+88x^2+468x$ is $x + b$, where *b* is a positive constant. What is the smallest possible value b ?

The answer is : .....