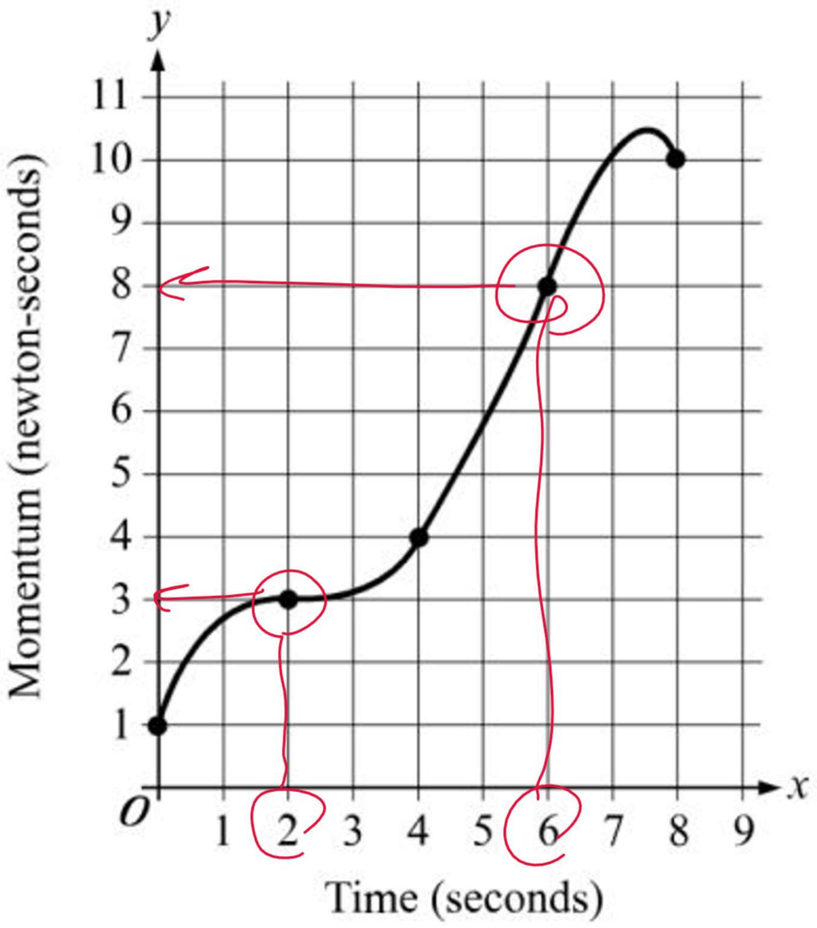
(9)



The graph shows the momentum y, in newton-seconds, of an object x seconds after the object started moving, for $0 \le x \le 8$. What is the average rate of change, in newton-seconds per second, in the momentum of the object from $x = 2$ to $x = 6$?

(A) $\frac{5}{4}$
(B) 1.25

(10) $(x + 64)^2 = -100$

How many distinct real solutions does the given equation have?

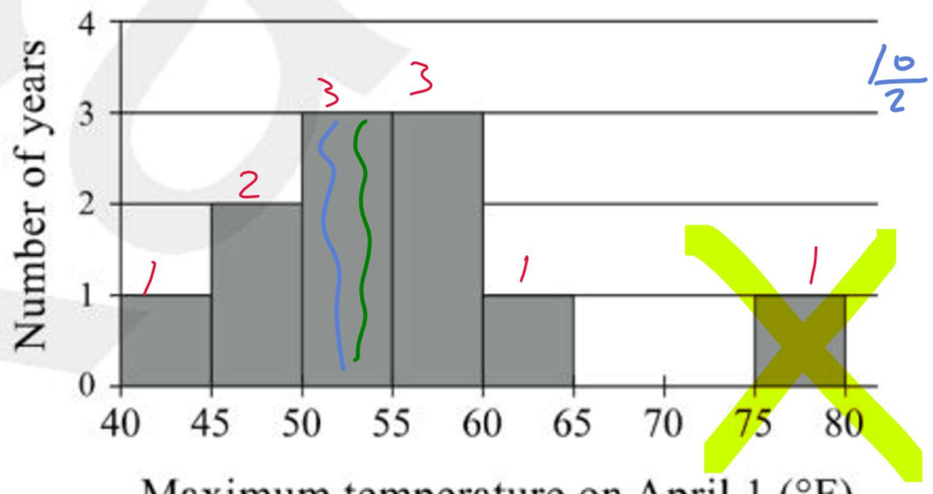
(A) Exactly one
(B) Exactly two
(C) Infinitely many
(D) Zero

(11) $|x - 8| = 11$

What is he sum of the solutions to the given equation?

(A) 0
(B) 16
(C) 19
(D) 22

(12) The maximum temperature on April 1. In degrees Fahrenheit (°F), was recorded each year at a certain weather station for 11 years. The histogram summarizes the recorded data set.



The temperature of 76.2°F is removed from this data set to create a new data set of 10 temperatures. Which of the statements must be true?

I. The mean of the new data set id less than the mean of the original data set.

II. The median of the new data set is less than the median of the original data set.

(A) I only.
(B) II only.
(C) I and II.
(D) Neither I nor II.

A : Z
1 : 1
Error ↑

A : Z
99 : 1
Error ↓

(13) The manager of a gym selected a sample of 159 members at random to estimate the percentage of the gym's members that would continue to pay for a membership if the price increased. From the survey, the manager estimates that 88% of the gym's members would continue to pay for a membership if the price increased, with an associated margin of error of 5.05%. If the survey is repeated with a random sample of 318 members and the results are calculated in the same way, which of the following will be the most likely effect of using the larger random sample compared to the smaller random sample?

(A) The margin of error will be lower.
(B) The margin of error will be higher.
(C) The estimate of the percentage of the gym's members that would continue to pay for a membership if the price increased will be lower.
(D) The estimate of the percentage of the gym's members that would continue to pay for a membership if the price increased will be higher.

(14) For the positive quantities h, j and k, 44% of h is equivalent to 62% of j, and j is equivalent to 22% of k. What percentage of k is h? (Disregard the % sign when entering your answer. For example, if your answer is 39%, enter 39)

31

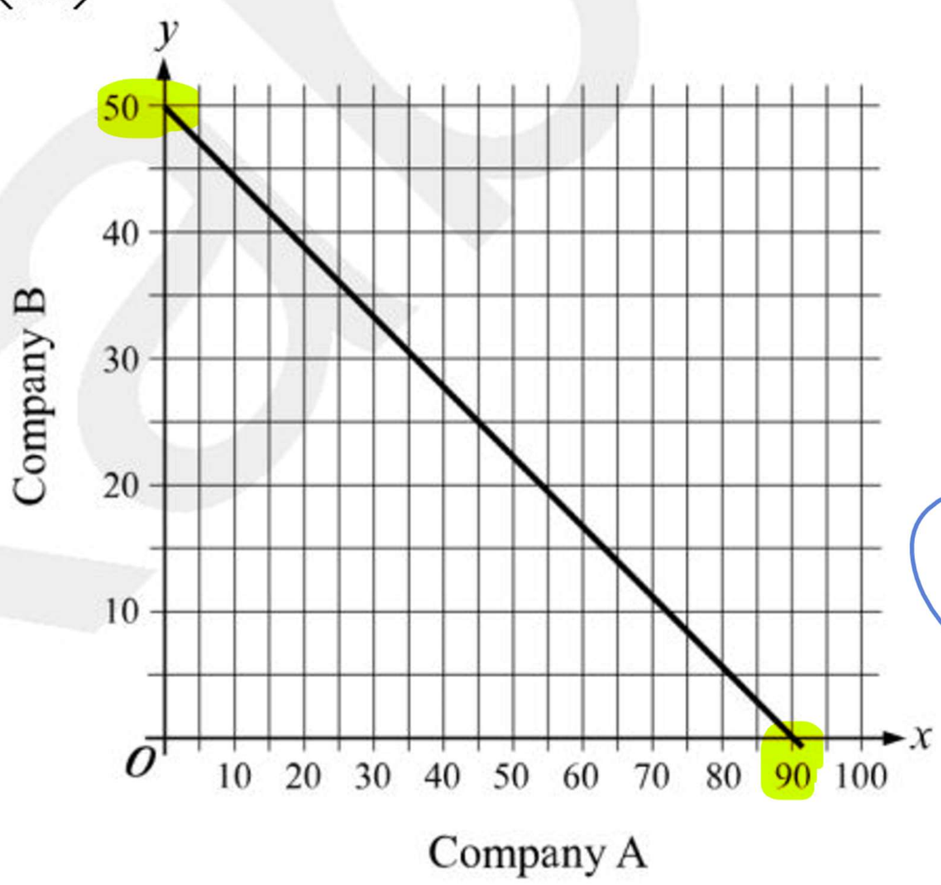
$0.44h = 0.62J$

$J = 0.22K$

$0.44h = 0.62(0.22K)$

$h = 0.31K$

(15)



The graph shows the relationship between the number of shares of stock from Company A, X, and the number of shares of stock from Company B, Y, that Sayen can purchase. Which equation could represent this relationship?

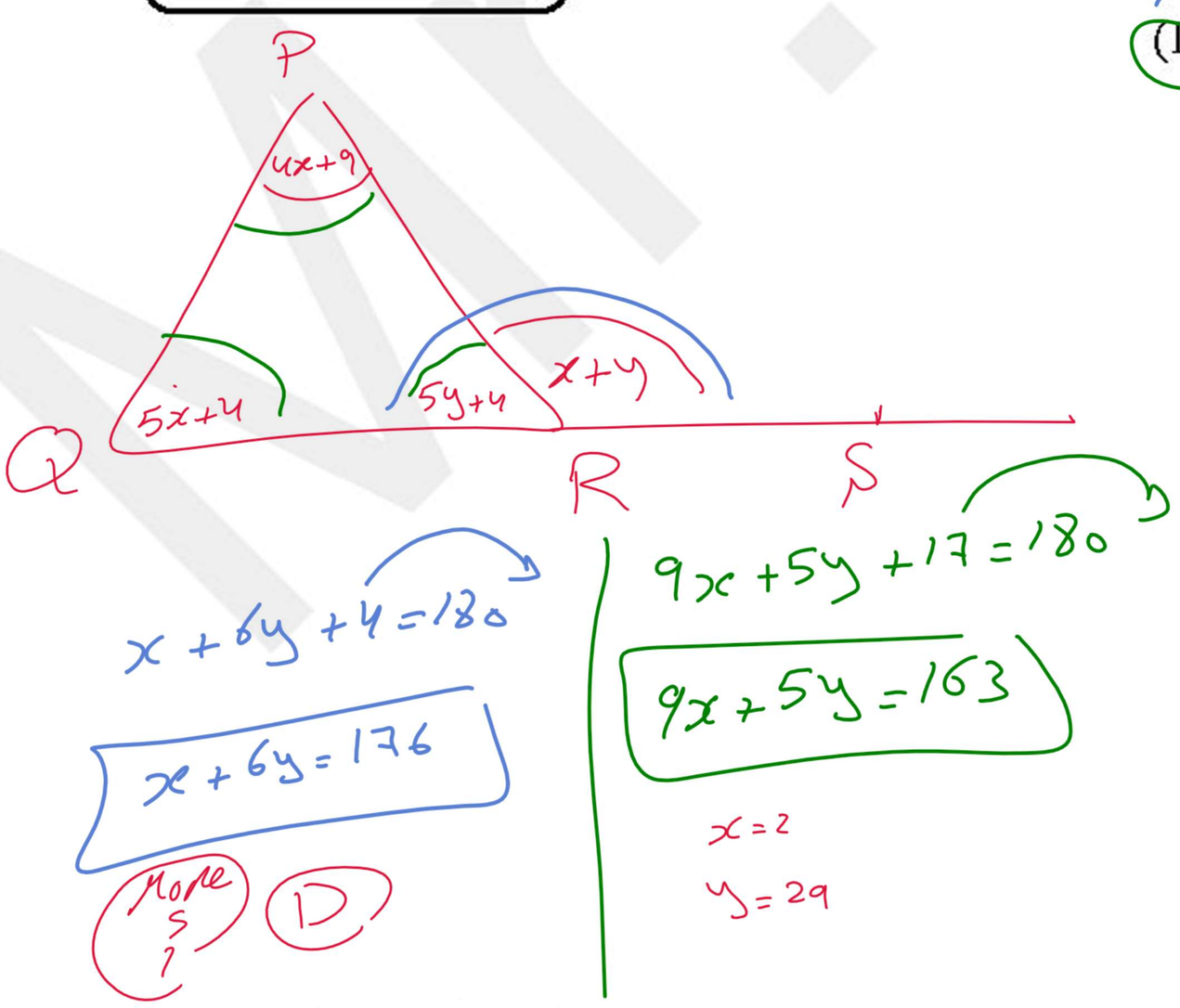
(A) $y = 10x + 18$
(B) $10x + 18y = 900$
(C) $y = 18x + 10$
(D) $18x + 10y = 900$

(16) For the exponential f, the value of $f(1)$ is k. Where k is a constant. Which of the following equivalent forms of the function f shows the value of k as the coefficient or the base?

(A) $f(x) = 35(1.2)^{x+1}$
(B) $f(x) = 42(1.2)^{x}$
(C) $f(x) = 50.4(1.2)^{x-1}$
(D) $f(x) = 60.48(1.2)^{x-2}$

(17) In triangle PQR, the measure of angle P is $(4x+9)°$, the measure of angle Q is $(5x+4)°$, and the measure of angle R is $(5y+4)°$. If side QR is extended through point R to point S, and the measure of angle PRS is $(x + y)°$, what is the value of $x + y$?

$2+29 = 31$



$x + 6y + 4 = 180$

$x + 6y = 176$

More Sol? D

$9x + 5y + 17 = 180$

$9x + 5y = 163$

$x = 2$

$y = 29$

(18) The triangle inequality theorem states that the sum of any two sides of a triangle must be greater than the length of the third side. If a triangle has side lengths of 5 and 9, which inequality represents the possible lengths, X, of the third side of the triangle?

Diff < Any side < Sum

$9-5 < x < 9+5$

$4 < x < 14$

(A) $x < 14$
(B) $x > 14$
(C) $4 < x < 14$
(D) $x < 4$ or $x > 14$

(19) A right circular cone has a volume of $34{,}496\pi$ cubic centimeters and the area of its base is $3{,}136\pi$ square centimeters. What is the slant height, in centimeters, of this cone?

πr^2

V. Cone $= \frac{1}{3}(\pi r^2)h$

$34496\pi = \frac{1}{3}(3136\pi)h$

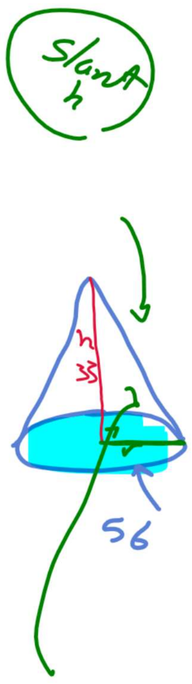
shift solve

$h = 33$

(A) 11
(B) 33
(C) 56
(D) 65

$\pi r^2 = 3136\pi$

$r = 56$



$\sqrt{33^2 + 56^2}$

$= 65$

$y = a(x-5)^2 + 400$

$0 = a(0-5)^2 + 400$

shift sym

$a = -16$

$y = -16(9-5)^2 + 400$

$= 144$

(20) A quadratic function models the height, in feet, of an object above the ground in terms of the time, in seconds, after the object was launched. According to the model, the object was launched from a height of 400 feet 5 seconds after it was launched. Based on the model, what was the height.in feet, of the object 9 seconds after it was launched?

vertex (5, 400)

(0, 0)

144

(21) The cost of renting a power washer is \$56 for the first day and \$28 for each additional day. Which of the following functions gives the cost $C(d)$, in dollars, of renting the power washer for d days, where d is a positive integer?

$28(1) + 28 = 56$

(A) $C(d) = 28d + 28$

(B) $C(d) = 28d + 56$

(C) $C(d) = 56d - 28$

(D) $C(d) = 56d + 84$

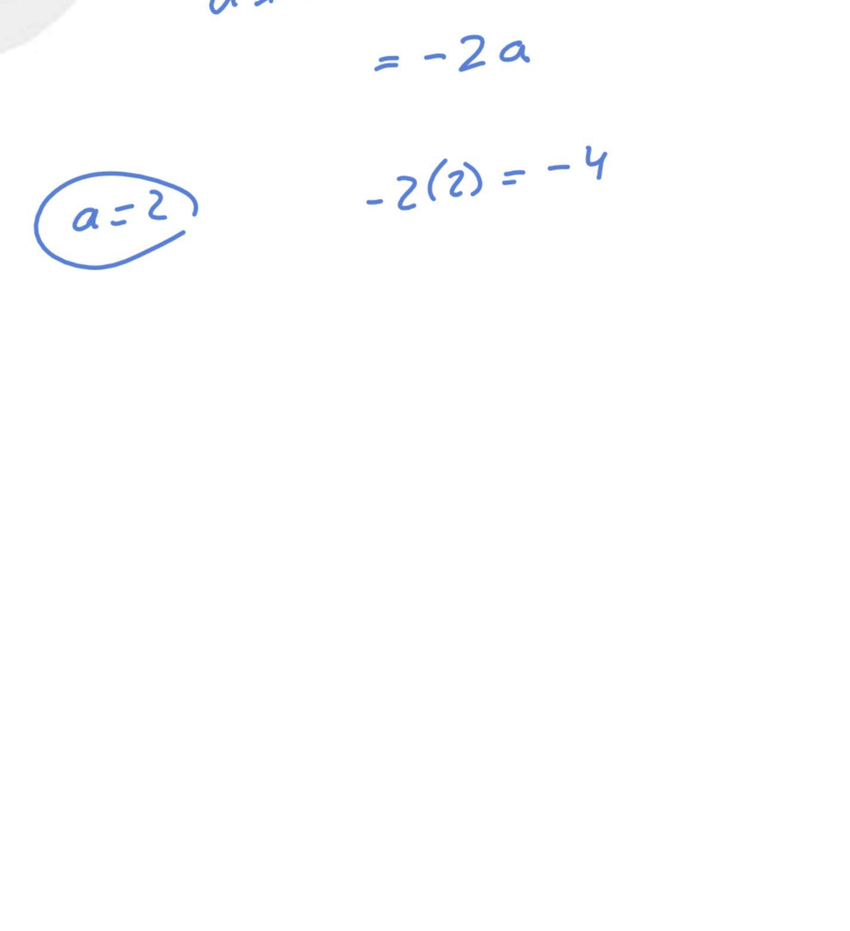
(22) The function f is defined by $f(x) = ax^2 + bx + c$, where a, b and c are constants. The graph of $y = f(x)$ in the xy-plane passes through the points (8,0) and (-5,0). If a is an integer greater than 1, which of the following could be the value of $a + b$?

(A) 4

(B) 3

(C) -2

(D) -4



$\frac{-5+8}{2}$

$-\frac{b}{2a} = 1.5$

$-b = 3a$

$b = -3a$

$a + b = a + -3a$

$= -2a$

$a = 2$

$-2(2) = -4$

1)

Which expression is equivalent to $\frac{y+12}{x-8}+\frac{y(x-8)}{x^2y-8xy}$?

a) $\frac{xy+y+4}{x^3y-16x^2y+64xy}$

b) $\frac{xy+9y+12}{x^2y-8xy+x-8}$

c) $\frac{xy^2+13xy-8y}{x^2y-8xy}$

d) $\frac{xy^2+13xy-8y}{x^3y-16x^2y+64xy}$

2)

Poll results:

Angel Cruz: 483

Terry Smith: 320

The data shows the result of a poll. A total of 803 voters selected at random were asked which candidate they would vote for in the upcoming election. According to the poll, if 6424 people vote in the election, by how many votes would Angel Cruz be expected to win?

a) 163

b) 1304

c) 3864

d) 5621

3)

The graph of $x^2+1x+y^2+1y=\frac{199}{2}$ in the xy-plane is a circle. What is the length of the circle's radius?

10

4) If $6+x=9$, what is the value of $18+3x$?

27

5)

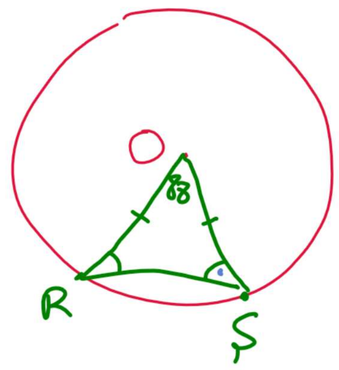
$$y=x^2-14x+22$$

The given equation relates the variables x and y. for what value of x does the value of y reach its minimum?

7

6) A circle has center O, and points R and S lie on the circle. In triangle ORS, the measure of $\angle ROS$ is 88 degree. What is the measure of $\angle RSO$, in degrees?

46



7) $x(x+1)-56=4x(x-7)$

what is the sum of the solutions to the given equation?

2.666 + 7

9.666

8) Isabel grows potatoes in her garden. This year, she harvested 760 potatoes and saved 10% of them to plant next year. How many of the harvested potatoes did Isabel save to plant next year?

0.10 x 760

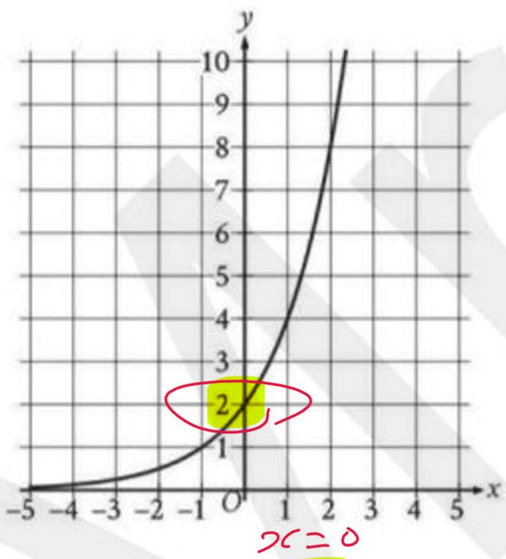
A) 66

B) 76

C) 84

D) 86

9)



x=0

What is the y-intercept of the graph shown?

a) (0,0)

b) (0,2)

c) (2,0)

d) (2,2)

10) What length, in centimeters, is equivalent to a length of 51 meters? (1 meter = 100 centimeters)

a) 0.051

b) 0.51

c) 5100

d) 51000

m cm
1 100
51 x

51 x 100 / 1

11) A bus travelling at a constant speed along a straight portion of road. The equation $d=30t$ gives the distance d, in feet from a road maker, that the bus will be t seconds after passing the marker. How many feet from the marker will the bus be 2 seconds after passing the marker?

t

A) 30

B) 32

30(2) = 60

C) 60

D) 90

12) Which expression is equivalent to $20w\ (4w+3w)$?

a) 10w

b) 13w

c) 19w

d) 21w

20w(7w)

$= 140w^2$

13) Which expression is equivalent to $9x^2 + 5x$?

a) $x(9x + 5)$

b) $5x(9x + 1)$

c) $9x(x + 5)$

d) $x^2(9x + 5)$

14) In triangle ABC, the measure of angle B is 52 degrees and the measure of angle C is 17 degrees. What is the measure of angle A?

a) 21 degrees

b) 35 degrees

c) 69 degrees

d) 111 degrees

15) $x = 8$

$y = x^2 + 8$

The graphs of the equations in the given system of equations intersect at the point (x,y) in the xy-plane. What is the value of y?

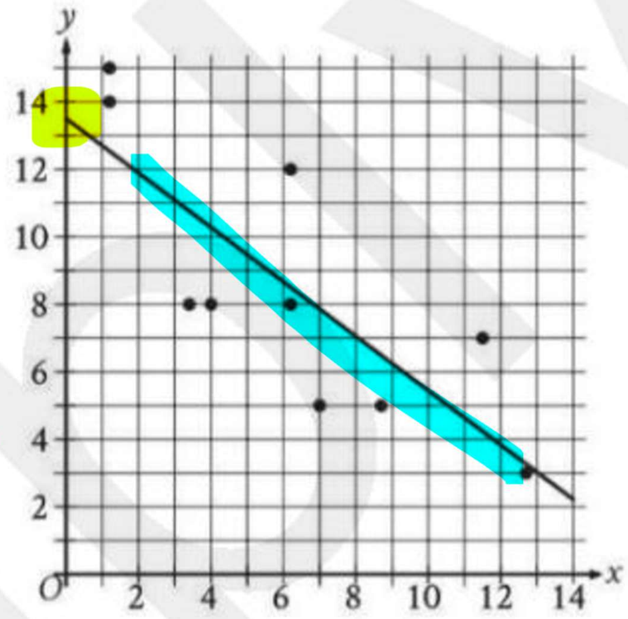
a) 8

b) 24

c) 64

d) 72

16) 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) $y = 13.5 + 0.8x$

b) $y = 13.5 - 0.8x$

c) $y = -13.5 + 0.8x$

d) $y = -13.5 - 0.8x$

17)

The function f is defined by $f(x) = 8\sqrt{x}$. For what value of x does $f(x) = 48$?

a) 6

b) 8

c) 36

d) 64