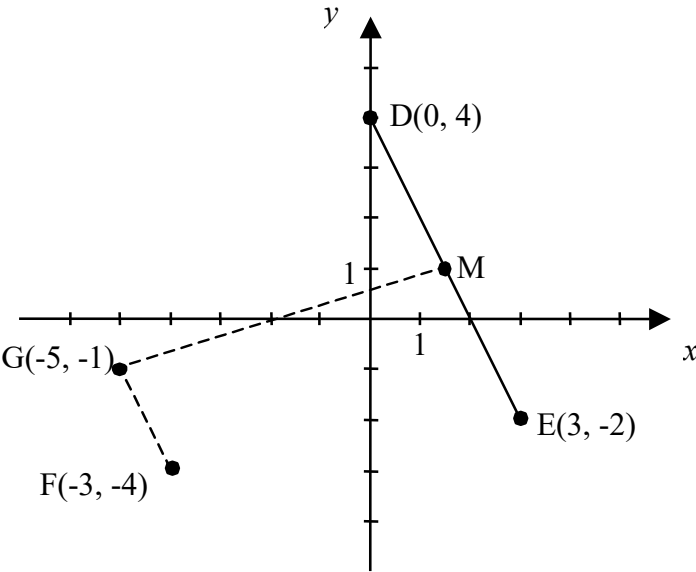


1

To service a new residential development, the town surveyor has drawn on a Cartesian plane the new part of the water main that must be constructed.

\overline{DE} represents the existing water main.

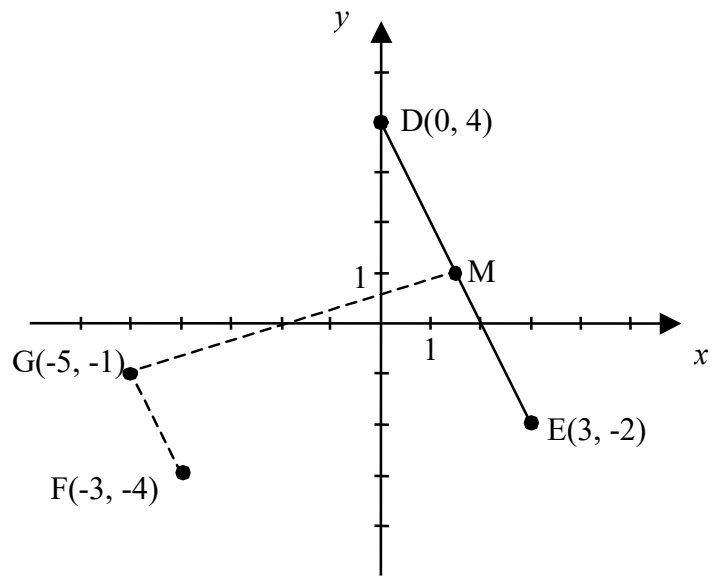
\overline{FG} and \overline{GM} represent the new water main, where M is the midpoint of \overline{DE}



Rounded to the nearest tenth, what is the total length of the new water main FGM?

Show all your work.

Work



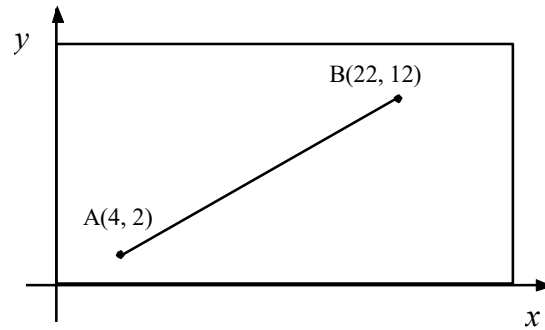
Result :

Rounded to the nearest tenth, the total length of the new water main FGM

is _____.

2

Vincent used a Cartesian plane to represent certain objects that make up a theatre set.



A third object must be placed on segment AB, at a point C located $\frac{3}{5}$ of the way along segment AB, starting from point A.

Identify the coordinates of point C.

A) $\left(\frac{74}{5}, 8\right)$

C) $\left(\frac{54}{5}, 6\right)$

B) $\left(\frac{56}{5}, 6\right)$

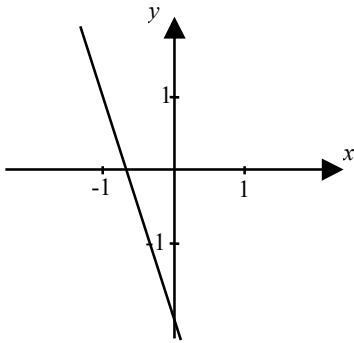
D) $\left(\frac{31}{4}, \frac{43}{4}\right)$

3

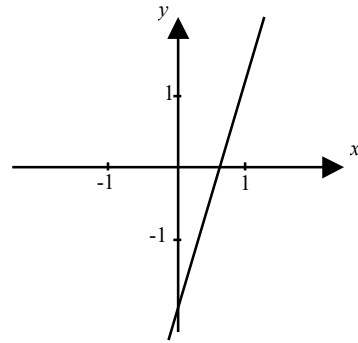
The slope of a linear function is 3 and its y-intercept is -2.

Which of the following graphs represents this function?

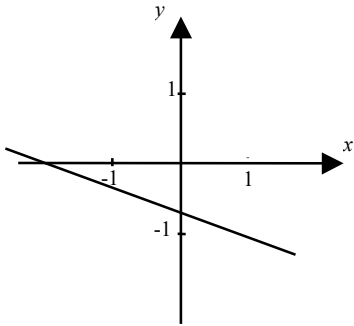
A)



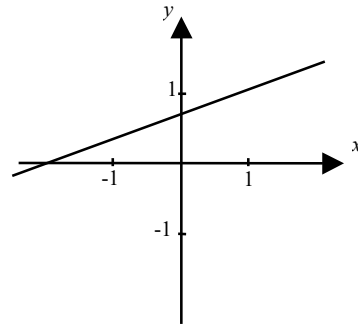
C)



B)

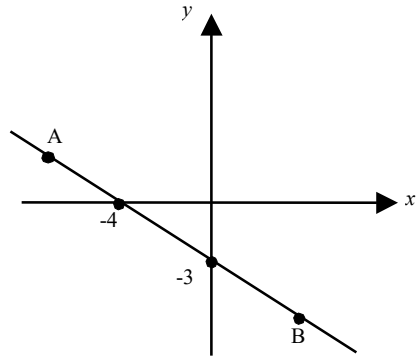


D)



4

Line AB is represented in the following Cartesian plane.



What are the slope m and the y -intercept b of line AB?

A) $m = \frac{-3}{4}$

$b = -3$

C) $m = \frac{-3}{4}$

$b = -4$

B) $m = \frac{3}{4}$

$b = -3$

D) $m = \frac{-4}{3}$

$b = -3$

5

Two lines are drawn in a Cartesian plane. The equations of these lines are $y = \frac{3}{2}x + 5$ and

$$y = -\frac{2}{3}x + 5.$$

What is the relative position of these lines?

- A) They are parallel and distinct.
- B) They are parallel and coincident.
- C) They are perpendicular to each other.
- D) They intersect but are not perpendicular to each other.

6

Determine if the following pairs of equations represent lines which are :

- parallel and distinct

- coincident

- intersecting

- perpendicular

a) $d : 2x + y - 3 = 0$ and $d' : 3x - 4y + 1 = 0$

b) $d : 4x - y + 3 = 0$ and $d' : x + 4y - 2 = 0$

c) $d : x - 2y + 3 = 0$ and $d' : -4x + 8y - 12 = 0$

d) $d : 3x - 4y + 1 = 0$ and $d' : 6x - 8y - 9 = 0$

e) $d : y + 5 = 0$ and $d' : x - 3 = 0$

a) _____

b) _____

c) _____

d) _____

e) _____

7

Solve the following systems of equations.

a) $x + 2y = 11$ and $x - 3y = -9$

b) $2x + y = 7$ and $4x - 2y = 2$

a) _____

b) _____

8

In order to go to summer camp, a child has to pay a registration fee as well as a fixed amount per day at the camp.

For her registration and 3 days at camp, Emily paid \$120. John paid \$160 for his registration and 5 days at camp.

How much would it cost for 2 days at camp including registration?

Show all the steps in your solution.

During a basketball free throw shooting contest, each participant was allowed to take 20 free throws. The results are recorded in the adjacent chart.

Number of Free Throws

Throws completed	Frequency
20	3
19	6
18	4
16	8
15	2
13	10
11	6
10	3
9	2
8	4
7	1
4	1

What is the percentile rank of 18 successful free throws?

The percentile rank is _____.

10

The cost of a half-page advertisement in a school yearbook is \$100 while a full-page ad is \$180.

The treasurer reported that the 35 advertisements sold do not surpass \$4500.

This situation can be expressed by the following system of inequalities :

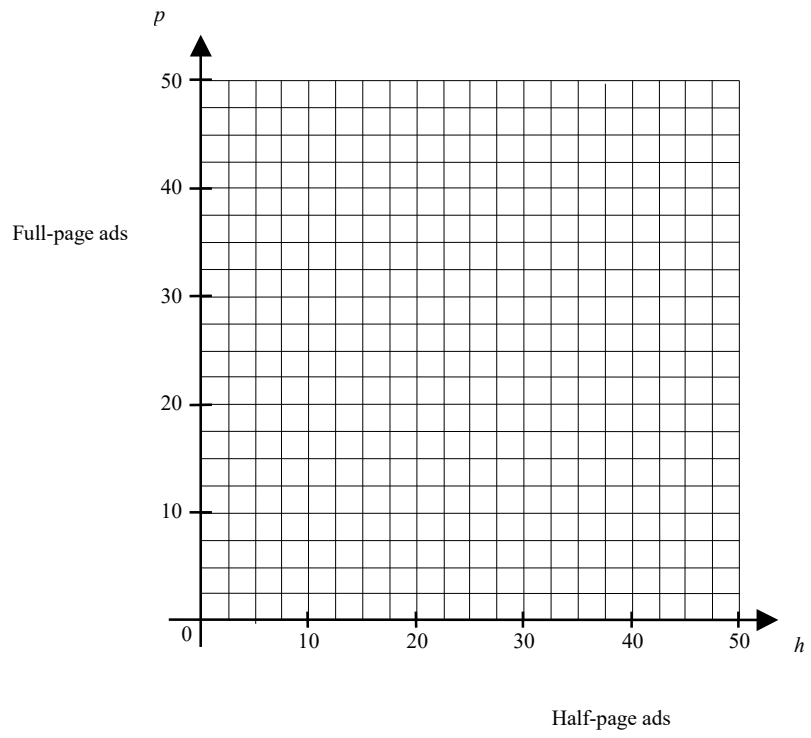
$$h + p > 35$$

$$100h + 180p \leq 4500$$

h : number of half-page ads

p : number of full-page ads

Graph this system of inequalities.

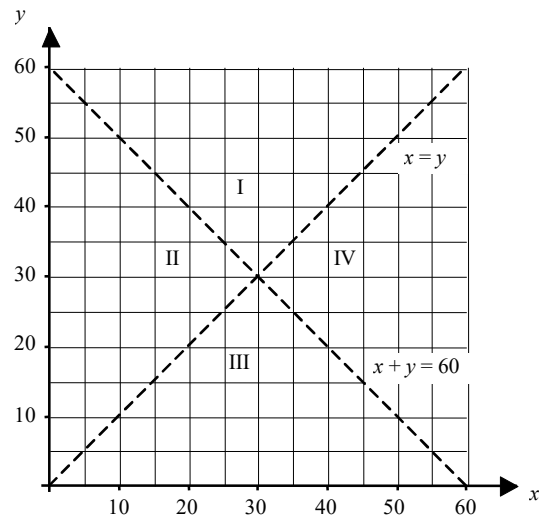


11

Given the following system of inequations :

$$x < y \text{ and } x + y > 60 \text{ where } x > 0 \text{ and } y > 0$$

Which region of the graph represents the solution set of this system of inequations?



A) I

B) II

C) III

D) IV

12

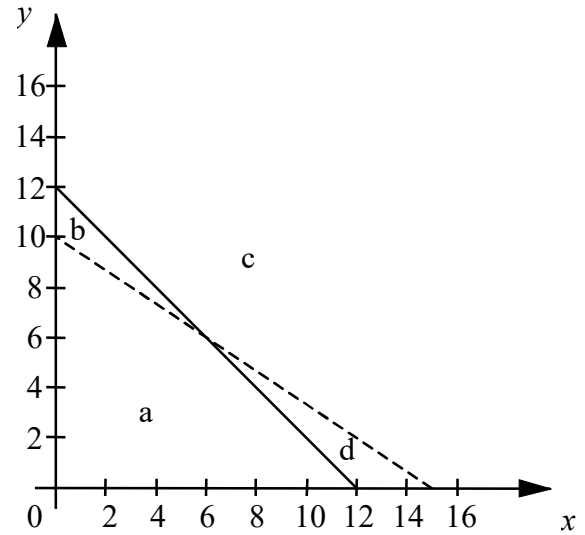
Given the following system of inequalities

$$x + y \leq 12$$

$$2x + 3y > 30$$

where x and y are positive.

The solution set of this system of inequalities lies in one of the 4 regions (a, b, c or d) of the graph on the right.



In which region does the solution set of this system lie?

A) a

C) c

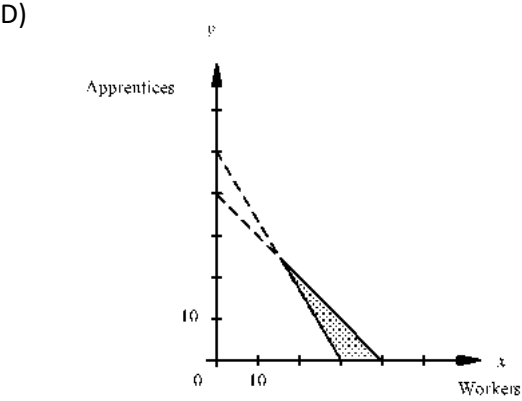
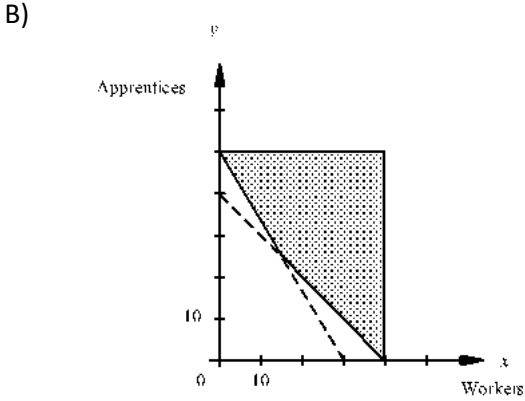
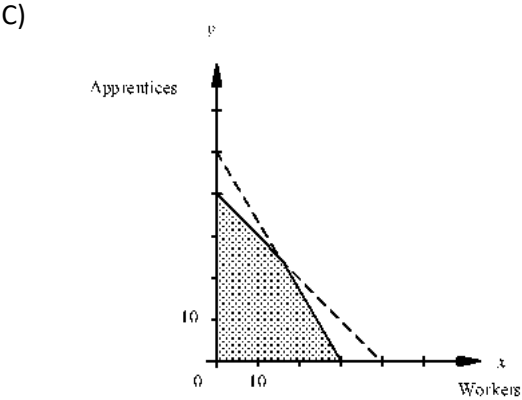
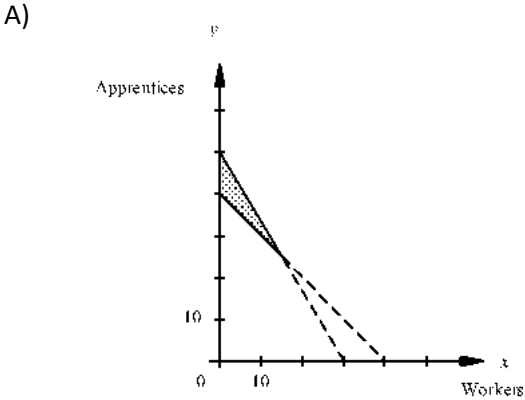
B) b

D) d

The foreman of a construction site has to decide how many workers and how many apprentices he needs for the job. He has to take the two following constraints into consideration when making his decision :

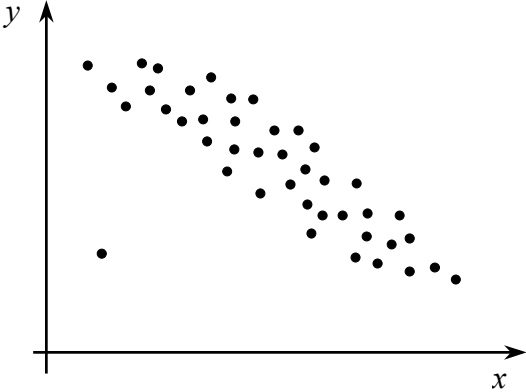
- the total number of employees has to be at least 40;
- workers are paid \$100 per day and apprentices, \$60; the total amount paid out in wages each day must not exceed \$3000.

Which of the following graphs contains all the possibilities that are available to the foreman?



14

The following scatter plot represents the relationship between two variables.



What is the value of the correlation coefficient?

15

Which one of the following correlation coefficients represents the lowest correlation?

A) -0.6

C) 0.1

B) -0.2

D) 0.8

16

A school held a track and field competition. The table below lists the height jumped by 14 competitors in the high jump event, according to the students' age.

Height Jumped According to Age

Age (years)	Height (cm)
8	85
8	90
9	90
9	100
9	105
10	95
10	110

Age (years)	Height (cm)
16	150
16	160
16	170
17	165
17	170
17	180
18	180

Given the above results, how high could a 13-year-old child be expected to jump?

Show all your work.

Each of the following scatter plots represents a distribution.

For which of these distributions is the linear correlation between the variables x and y the strongest?

