Mathematics

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(Chapter – 13) (Two Variables, One Line) (Assignment 3)

(Class – 9)

Name _____ Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your working and give reasons where required. Figures are schematic unless stated otherwise.

Section A: Multiple Choice Questions

1. How many lines exist that have a given slope and pass through a given point?

(a) Exactly one
(b) Exactly two
(c) No lines
(d) Infinitely many

2. In countries like the USA, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Celsius to Fahrenheit:

$$F = \frac{9}{5}C + 32$$

If the temperature is 95 °F, what is the temperature in Celsius?

(a) 25 °C (b) 30 °C
(c) 35 °C (d) 40 °C

3. Use the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}, \frac{c_1}{c_2}$, to determine whether the lines representing the following pairs of linear equations intersect at a point, are parallel or are coincident.

$$5x - 4y + 8 = 0; 7x + 6y - 9 = 0$$

(a) Parallel and distinct
(b) Intersect at one point
(c) Coincident
(d) Neither equation is linear

4. Use the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}, \frac{c_1}{c_2}$, to determine whether the lines representing the following pairs of linear equations intersect at a point, are parallel or are coincident.

$$9x + 3y + 12 = 0; 18x + 6y + 24 = 0$$

(a) Parallel and distinct
(b) Perpendicular
(c) Intersect at one point
(d) Coincident

5. Which ordered pair satisfies $2x - y = 5$?

(a) (1, 3) (b) (3, 1)
(c) (2, 1) (d) (0, 5)

Section B: Very Short Answer Questions

6. State whether the following sentence is True or False. Justify your answer.
A linear equation in two variables can never have rational solutions.

Answer:

7. State whether the following sentence is True or False. Justify your answer.
$x = 3$ is a valid linear equation in two variables.

Answer:

8. State whether the following sentence is True or False. Justify your answer.
The equation $2x + 3y = 7$ has infinitely many solutions.

Answer:

9. State whether the following sentence is True or False. Justify your answer.

The point (1, 2) is a solution of the equation 2x + 3y = 7.

Answer:

10. Given the linear equation $2x + 3y - 8 = 0$, write another linear equation in two variables so that the graphs of the pair formed represent intersecting lines.

Answer:

Section C: Short and Long Answer Questions

11. Find two solutions which lie in different quadrants for each of the following linear equations. Identify the quadrants in which the points lie.

$$-5x + 3y = 7$$

Verify your solutions by representing the linear equations on a graph paper.

Answer:

12. Form a pair of linear equations for the following problem and find their solutions.

The taxi charges in a city consist of a fixed charge together with the charge for the distance covered for every km. For a distance of 10 km, the total amount paid is ₹155 and for a journey of 15 km, the total amount paid is ₹220. What is the fixed charge and the charge per km? How much does a person have to pay for travelling a distance of 25 km?

Answer:

13. Cycle-hire Shop A charges ₹18 plus ₹12 per hour. Shop B charges ₹30 plus ₹8 per hour. Draw both cost graphs for 0 to 8 hours. Find when the costs are equal and identify the cheaper shop before and after that time.

Answer:

14. Check whether the following pairs of linear equations have solutions? If they have solutions, find them graphically.

$$x + y = 5,\ 2x + 2y = 10$$

Answer:

15. In countries like the USA, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Celsius to Fahrenheit:

$$F = \frac{9}{5}C + 32$$

Draw the graph of the linear equation above using Celsius on the *x*-axis and Fahrenheit on the *y*-axis.

Answer: