Mathematics

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(Chapter – 13) (Two Variables, One Line) (Assignment 4)

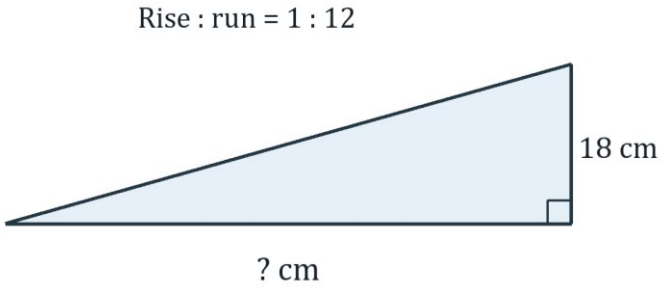
(Class – 9)

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.

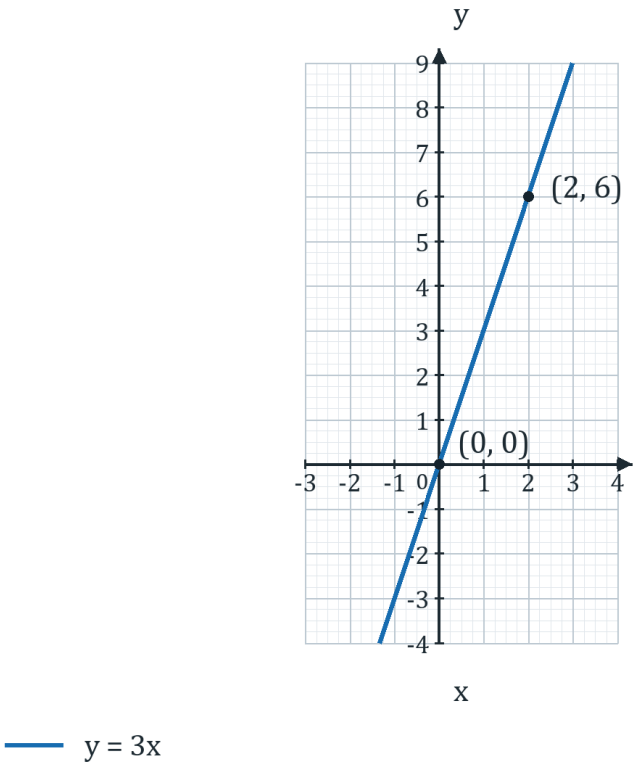
Section A: Multiple Choice Questions

1. An accessibility ramp for wheelchairs is to be made alongside the staircase. The guidelines given for the slope of the ramp is 1 cm vertical rise to 12 cm horizontal length. What should be the horizontal length of the ramp if the total height of the stairs is 18 cm?



(a) 18 cm
(b) 30 cm
(c) 216 cm
(d) 1.5 cm

2. The graph of the line $y = 3x$, passing through (0, 0) and (2, 6) is given below.
A water tank is being filled so that the water level y (in cm) after x minutes follows this graph.
How many minutes will it take for the water to reach a height of 21 cm?



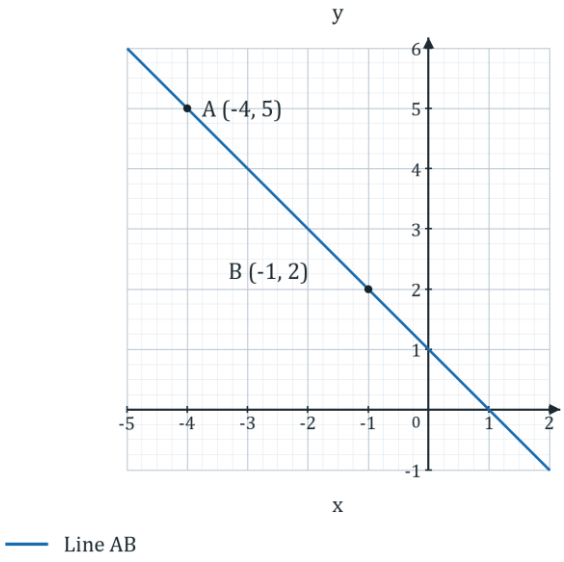
(a) 3 minutes
(b) 6 minutes
(c) 7 minutes
(d) 21 minutes

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.

$$6x - 3y + 10 = 0; 2x - y + 9 = 0$$

(a) Coincident
(b) Parallel and distinct
(c) Intersect at one point
(d) Both pass through the origin

4. Consider the line in the figure which passes through A(–4, 5) and B(–1, 2). Find the slope of the line.



(a) –1
(b) 0
(c) 1
(d) 3

5. Which line has slope –3 and y-intercept 2?

(a) y = 2x – 3
(b) y = –3x + 2
(c) y = 3x + 2
(d) x = –3y + 2

Section B: Very Short Answer Questions

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

Answer:

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

Answer:

8. Give a formula to find the x-intercept of the line $y = mx + c$.

Answer:

9. For what values of p does the pair of equations given below have a unique solution?

$4x + py + 8 = 0$; $2x + 2y + 2 = 0$.

Answer:

10. Compare the solutions of the equations $3x + 4y = 7$ and $6x + 8y = 14$. Argue that they have the same set of solutions, that is, every solution of one is also a solution of the other.

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 equation on a graph paper.

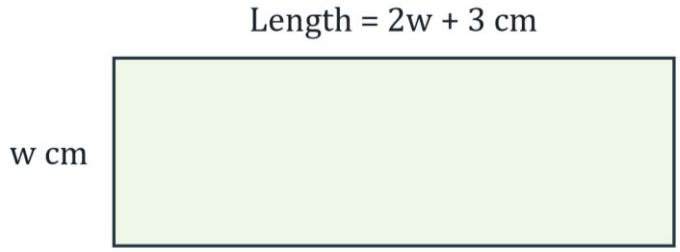
Answer:

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

If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes equal to $\frac{1}{2}$ if we add 1 only to the denominator. What is the fraction?

Answer:

13. A rectangle has perimeter 48 cm. Its length is 3 cm more than twice its width. Form two linear equations and find its dimensions.



Answer:

14. Solve the following system of equations graphically:

$$2x + y = 6,\ 2x - y - 2 = 0.$$

Answer:

15. A person is choosing between two mobile plans.

Plan A: ₹50 monthly fee + ₹0.20 per minute of call time.

Plan B: ₹30 monthly fee + ₹0.30 per minute of call time.

For how many minutes of calling per month is Plan A cheaper than Plan B? For how many minutes is Plan B cheaper? Also find the number of minutes at which both plans cost the same.

Answer: