



CREST Mathematics Olympiad (CMO) Worksheet *for* Class 9



Topic

Linear Equations



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Worksheet on Linear Equations

1. Harry purchases a Jeep and a car from a dealer. The cost of the car is seven thousand less than four times the cost of the jeep. Which linear equation in two variables represents this statement?

- a. $x + 4y + 7000 = 0$
- b. $x + 4y - 7000 = 0$
- c. $x - 4y + 7000 = 0$
- d. $x - 4y - 7000 = 0$

2. Which one of the following options is true for the following linear equation?

$$y = 2x - 3$$

- a. No solution
- b. One solution
- c. Two solutions
- d. infinite solutions

3. Selena boards a taxi for her office which is 2 kilometres from her home. The fare meter shows \$12 after one kilometre and for the upcoming kilometres, it drops to \$7. What will be the linear equation for the above-mentioned incident and what is the total fare if she travelled for 12.5 kilometres?

- a. $y = 7x + 5$; \$90.5
- b. $y = 7x + 5$; \$92.5
- c. $y = 7x + 12$; \$90.5
- d. $y = 7x + 12$; \$92.5

4. The graph of the linear equation $7x - 3y = 21$ cuts the X-axis at the point?

- a. (2, 0)
- b. (3, 0)
- c. (4, 0)
- d. (5, 0)

5. What are the coordinates of the points where the line represented by the linear equation $y = 3x - 6$ intersects the X-axis and Y-axis?

- a. (2, 0), (0, -4)
- b. (4, 0), (0, -2)
- c. (2, 0), (0, -6)
- d. (6, 0), (0, -2)

Answer Key

1. $c - x - 4y + 7000 = 0$

Explanation: Let the cost of a car be \$x and a jeep be \$y.

The cost of the car is seven thousand less than four times the cost of the jeep.

Cost of a car = 4 × cost of a jeep – 7000

$$\Rightarrow x = 4y - 7000$$

$$\Rightarrow x = 4y - 7000$$

$\therefore x - 4y + 7000 = 0$ is a linear equation in two variables to represent this statement.

2. d - infinite solutions

Explanation: When we put different values of 'x' in the given equation $y = 2x - 3$, we get different values of 'y' as well.

For $x = 1$:

$$y = 2x - 3$$

$$= 2 \times 1 - 3$$

$$= 2 - 3$$

$$= -1$$

For $x = 2$:

$$y = 2x - 3$$

$$= 2 \times 2 - 3$$

$$= 4 - 3$$

$$= 1$$

For $x = 3$:

$$y = 2x - 3$$

$$= 2 \times 3 - 3$$

$$= 6 - 3$$

$$= 3 \text{ and so on } \dots\dots$$

Here, in this equation x can have infinite values and for all the infinite values of x, there are infinite values of y as well.

$\therefore y = 2x - 3$ has infinite solutions.

3. b - $y = 7x + 5$; \$92.5

Explanation: Let total distance covered = x and total fare = \$y

Fare for the first kilometre = \$12

Fare after first kilometre = \$7

Total distance left after covering first kilometre = $(x - 1)$

Fare after covering first kilometre = $7(x - 1)$

Total fare = fare of first kilometre + fare after the first kilometre

$$y = 12 + 7(x - 1)$$

$$y = 12 + 7x - 7$$

$$y = 7x + 5$$

$\therefore y = 7x + 5$ will be the linear equation for the above-mentioned incident.

If $x = 12.5$ km, then

Total fare (y) = $7x + 5$

$$= 7 \times 12.5 + 5$$

$$= \$92.5$$

4. b - (3, 0)

Explanation: The given line $7x - 3y = 21$ cuts the X-axis and at the X-axis coordinate of $y = 0$.

Putting $y = 0$ in the above equation $7x - 3y = 21$, we get:

$$7x - 3y = 21$$

$$7x - 0 \times y = 21$$

$$7x - 0 = 21$$

$$\therefore 7x = 21$$

$$\therefore x = 21/7$$

$$\therefore x = 3$$

So, the point where the line $7x - 3y = 21$ cuts the X-axis will be (3, 0).

5. c - (2, 0), (0, -6)

Explanation: Given: $y = 3x - 6$

This line intersects both the X-axis and Y-axis. Thus, to get the pair values of (x, y).

The point on the X-axis which intersects the line is (x, 0) and the point on the Y-axis which intersects the line is (0, y).

At $x = 0$,

$$y = 3x - 6$$

$$y = 3 \times 0 - 6$$

$$y = 0 - 6$$

$$y = -6$$

The point on the Y-axis which intersects the line = (0, -6)

Similarly, at $y = 0$,

$$y = 3x - 6$$

$$0 = 3 \times x - 6$$

$$3x = 6$$

$$x = 2$$

The point on the X-axis which intersects the line = (2, 0)

$\therefore$ This line will intersect the X-axis at (2, 0) and will intersect the Y-axis at (0, -6).

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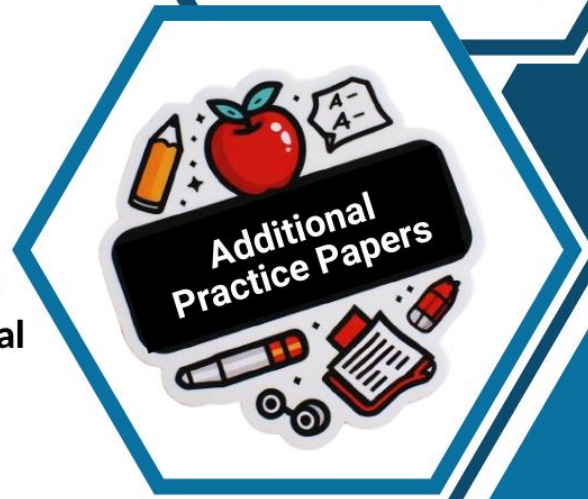
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