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1. Find, which of the following points lie on the line x - 2y + 5 = 0:
(i) (1, 3) (ii) (0, 5)
(iii) (-5, 0) (iv) (5, 5)
(v) (2, -1.5) (vi) (-2, -1.5)
Solution:

Given line equation is x - 2y + 5 = 0.

(i) On substituting x = 1 and y = 3 in the given line equation, we have
L.H.S. = 1 - 2(3) + 5 = 1 - 6 + 5 = 6 - 6 = 0 = R.H.S.
Hence, the point (1, 3) lies on the given line.

(ii) On substituting x = 0 and y = 5 in the given line equation, we have
L.H.S. = 0 – 2(5) + 5 = -10 + 5 = -5 ≠ R.H.S.
Hence, the point (0, 5) does not lie on the given line.

(iii) On substituting x = -5 and y = 0 in the given line equation, we have
L.H.S. = -5 – 2(0) + 5 = -5 - 0 + 5 = 5 - 5 = 0 = R.H.S.
Hence, the point (-5, 0) lies on the given line.

(iv) On substituting x = 5 and y = 5 in the given line equation, we have
L.H.S. = 5 – 2(5) + 5 = 5 - 10 + 5 = 10 - 10 = 0 = R.H.S.
Hence, the point (5, 5) lies on the given line.

(v) On substituting x = 2 and y = -1.5 in the given line equation, we have
L.H.S. = 2 - 2(-1.5) + 5 = 2 + 3 + 5 = 10 ≠ R.H.S.
Hence, the point (2, -1.5) does not lie on the given line.

(vi) On substituting x = -2 and y = -1.5 in the given line equation, we have
L.H.S. = -2 - 2(-1.5) + 5 = -2 + 3 + 5 = 6 ≠ R.H.S.
Hence, the point (-2, -1.5) does not lie on the given line.

2. State, true or false:
(i) the line x/2 + y/3 = 0 passes through the point (2, 3).
(ii) the line x/2 + y/3 = 0 passes through the point (4, -6).
(iii) the point (8, 7) lies on the line y - 7 = 0.
(iv) the point (-3, 0) lies on the line x + 3 = 0.
(v) if the point (2, a) lies on the line 2x - y = 3, then a = 5.
Solution:

(i) The given line is x/2 + y/3 = 0
Substituting x = 2 and y = 3 in the given equation,
L.H.S = 2/2 + 3/3 = 1 + 1 = 2 ≠ R.H.S
Hence, the given statement is false.

(ii) The given line is x/2 + y/3 = 0
Substituting x = 4 and y = -6 in the given equation,
L.H.S = 4/2 + (-6)/3 = 2 – 2 = R.H.S
Hence, the given statement is true.

(iii) The given line is y - 7 = 0
Substituting y = 7 in the given equation,
L.H.S = y - 7 = 7 - 7 = 0 = R.H.S.
Hence, the given statement is true.

(iv) The given line is x + 3 = 0
Substituting x = -3 in the given equation,
L.H.S. = x + 3 = -3 + 3 = 0 = R.H.S
Hence, the given statement is true.

(v) The point (2, a) lies on the line 2x - y = 3.
Substituting x = 2 and y = a in the given equation, we get
So, 2(2) - a = 3
4 - a = 3
a = 4 - 3 = 1
Hence, the given statement is false.

3. The line given by the equation 2x – y/3 = 7 passes through the point (k, 6); calculate the value of k.
Solution:

Given line equation is 2x – y/3 = 7 passes through the point (k, 6).
So, on substituting x = k and y = 6 in the given equation, we have
2k – 6/3 = 7
6k – 6 = 21
6k = 27
k = 27/6 = 9/2
k = 4.5

4. For what value of k will the point (3, -k) lie on the line 9x + 4y = 3?
Solution:

The given line equation is 9x + 4y = 3.
On putting x = 3 and y = -k, we have
9(3) + 4(-k) = 3
27 - 4k = 3
4k = 27 - 3 = 24
k = 6

5. The line 3x/5 – 2y/3 + 1 = 0 contains the point (m, 2m - 1); calculate the value of m.

Solution:

The equation of the given line is 3x/5 – 2y/3 + 1 = 0
On putting x = m, y = 2m - 1, we have

$$\frac{3m}{5} - \frac{2(2m-1)}{3} + 1 = 0$$

$$\frac{3m}{5} - \frac{4m-2}{3} = -1$$

$$\frac{9m - 20m + 10}{15} = -1$$

9m – 20m + 10 = -15
-11m = -25
m = 25/11

$$m = 2\frac{3}{11}$$

6. Does the line 3x - 5y = 6 bisect the join of (5, -2) and (-1, 2)?
Solution:

It's known that the given line will bisect the join of A (5, -2) and B (-1, 2), if the co-ordinates of the mid-point of AB satisfy the line equation.
The co-ordinates of the mid-point of AB are
(5-1/2, -2+2/2) = (2, 0)
On substituting x = 2 and y = 0 in the given line equation, we have
L.H.S. = 3x - 5y = 3(2) - 5(0) = 6 - 0 = 6 = R.H.S.
Therefore, the line 3x - 5y = 6 bisect the join of (5, -2) and (-1, 2).