

Grade 9 Mathematics Worksheet

Intersections

Questions:

1. At what point does the line $3x - 4y = 7$ intersect
 - a) The line $y = -2$
 - b) The x axis
 - c) The line $x + 2y = 1$

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Solution:

1. a) $3x - 4y = 7 \Big|_{y=-2}$

$$\therefore 3x - 4(-2) = 7$$

$$\therefore 3x + 8 = 7$$

$$\therefore 3x = -1$$

$$\therefore x = -\frac{1}{3}$$

So they will intersect at $(-\frac{1}{3}; -2)$

b) $3x - 4y = 7 \Big|_{y=0}$

$$\therefore 3x - 4(0) = 7$$

$$\therefore 3x = 7$$

$$\therefore x = \frac{7}{3}$$

c) $3x - 4y = 7 \rightarrow 3x = 4y + 7 \dots (a)$

$$x + 2y = 1 \rightarrow x = 1 - 2y \rightarrow 3x = 3 - 6y \dots (b)$$

$$\text{So: } (a) - (b) \rightarrow 0 = 4y - (-6y) + 7 - 3$$

$$\therefore 0 = 10y + 4$$

$$\therefore y = -\frac{4}{10} = -\frac{2}{5}$$

$$\text{Then: } x = 1 - 2\left(-\frac{2}{5}\right) = 1 + \frac{4}{5} = \frac{9}{5}$$

$$\text{Point of intersection: } \left(\frac{9}{5}; -\frac{2}{5}\right)$$

For the function $3x - 4y = 7$ to intersect with the line $y = -2$ we need to make the y value -2 .

Pay attention to the notation when giving feedback to the learners.

For the intersection with the x -axis, $y = 0$. Pay attention to the notation when giving feedback to the learners.

When two functions intersect with one another they have a common point at that intersection.

We use elimination of one of the variables. This should not be taught procedurally, but understood conceptually.