

## Answer on Question #83642 – Math – Algebra

### Question

A submarine is moving inside the Atlantic ocean according to the formula  $y_1 = x^2 + 2x - 2$ . A school of fish is travelling inside the Atlantic ocean according to the formula of  $y_2 = -0.5$ . scientists have approached you, in order to help them in the following:

1. On the same graph, draw the tracks of both the submarine and the school of fish.
2. Find the roots of the submarine track, by solving the  $y_1$  equation.
3. Identify the co-ordinates of intersection between the submarine and the school of fish.

### Solution

$$2. y_1 = x^2 + 2x - 2;$$

$$x^2 + 2x - 2 = 0;$$

$$D = 4 + 4 * 2 = 12;$$

$$x_1 = \frac{-2 - \sqrt{12}}{2} = -1 - \sqrt{3};$$

$$x_2 = \frac{-2 + \sqrt{12}}{2} = -1 + \sqrt{3};$$

$x_1, x_2$  are roots of the submarine track.

$$3. y_1 = x^2 + 2x + 1 - 3;$$

$$y_1 = (x + 1)^2 - 3;$$

$$y_2 = -0.5;$$

$$x^2 + 2x - 2 = -0.5;$$

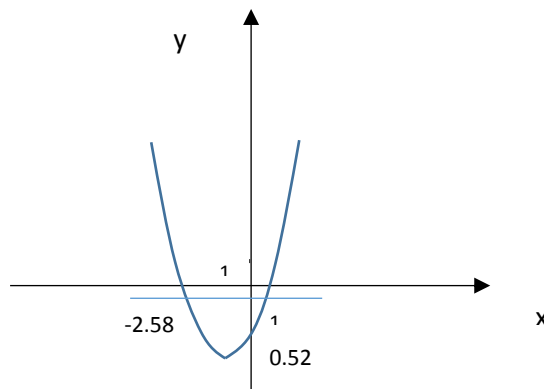
$$x^2 + 2x - 1.5 = 0;$$

$$D = 4 + 4 * 1.5 = 10;$$

$$x_{11} = \frac{-2 - \sqrt{10}}{2} \approx -2.58;$$

$$x_{22} = \frac{-2 + \sqrt{10}}{2} \approx 0.52.$$

1.



Thus,  $(-2.58; -0.5)$ ,  $(0.52; -0.5)$  are coordinates of intersection between the submarine and the school of fish.