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Quiz 0

Problem 1

Find the equation of a line that passes through the points $P_1(-6,-3)$ and $P_2(2,4)$.

Problem 2

Find the equation of a line that passes through the point $P_1(-6,-3)$ and has a slope 2.

Problem 3

Find the slope and the y-intercept of the equation of a line:

$$x + 3y = 0\,.$$

Problem 4

Solve for x:

$$4 = e^x\,.$$

Problem 5

Find the equation of a vertical line passing through the point $(5,0)$.

Solutions

Problem 1

The equation of a line is $y = mx + b$ with $m = \frac{y_2-y_1}{x_2-x_1}$ so

$$m = \frac{4-(-3)}{2-(-6)} = \frac{7}{8}$$

and we get

$$y = \frac{7}{8}x + b\,.$$

To calculate b, we substitute either point into the equation, for example $x = 2$, $y = 4$:

$$4 = \frac{7}{8}2 + b$$

from which $b = \frac{9}{4}$. The equation of a line is then:

$$y = \frac{7}{8}x + \frac{9}{4}\,.$$

Problem 2

We are given the slope $m = 2$ so:

$$y = 2x + b\,.$$

To calculate b, we substitute the point P_1 into the equation and solve for b:

$$-3 = 2(-6) + b\,,$$

$$b = 9\,.$$

The equation of a line is then:

$$y = 2x + 9\,.$$

Problem 3

We rewrite the equation to the form $y = mx + b$:

$$x + 3y = 0\,,$$

$$y = -\frac{1}{3}x\,.$$

So the slope is $m = -\frac{1}{3}$ and y-intercept is 0.

Problem 4

We apply the natural logarithm to both sides of the equation:

$$4 = e^x\,,$$

$$\ln 4 = \ln e^x$$

and use the identity $\ln e^x = x$:

$$x = \ln 4\,.$$

Problem 5

The equation of such line is just:

$$x = 5\,.$$