8.3 Point-Slope Form

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Recall that Point-Slope form is:

$$y - y_1 = m(x - x_1)$$

It is derived from the slope formula.

The point-slope form is used as a way to get the equation of a line. The equation of a line can be represented in two ways.

1. Standard Form
2. Slope-intercept form.

Standard Form of a line is:

$$Ax + By + C = 0$$

A, B, and C are integers.

no decimals or fractions

A is positive.

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9. $y + 6 = 2(x + 7)$

$y + 6 = 2x + 14$ (−y, −6)

$0 = 2x - y + 8$

10. $y - 3 = -5(x + 1)$

$y - 3 = -5x - 5$ (+5x, +5)

$5x + y + 2 = 0$

13. $y+1 = \frac{1}{3}(x-2)$

$3\left(y+1 = \frac{1}{3}x - \frac{2}{3}\right)$

$3y+3 = x-2$

$0 = x-3y-5$

$3(y+1) = \frac{1}{3}(x-2)$

$3y+3 = x-2$

$0 = x-3y-5$

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14. $2(y-1) = \frac{3}{2}(x-1)$

$2y-2 = 3x-3$

$0 = 3x-2y-1$

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15. $(2,3)$ $m=4$ $\Rightarrow$ create Standard Form

① use point-slope form

② rearrange to Standard Form

$y-y_1 = m(x-x_1)$

$y-3 = 4(x-2)$

$y-3 = 4x-8$

$0 = 4x-y-5$

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20. $(0,7)$ $m=-1$

$y-y_1 = m(x-x_1)$

$y-7 = -1(x-0)$

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

$x+y-7 = 0$

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22. $(5,4)$ $m=0$

$y-y_1 = m(x-x_1)$

$y-4 = 0(x-5)$

$y-4 = 0$

Do #25 on the boards.

28. $(-2, 1)$ $m = -1.5$

$y - y_1 = m(x - x_1)$

$y - 1 = -1.5(x + 2)$

10 $(y - 1 = -1.5x - 3)$

$10y - 10 = -15x - 30$

$15x + 10y + 20 = 0$

$\frac{15x + 10y + 20 = 0}{5}$

$3x + 2y + 4 = 0$

33. $A(3, 4)$ $B(4, 6)$

Find the Standard Form.

① Determine Slope

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - 4}{4 - 3} = \frac{2}{1} = 2$

② Point-Slope Form. use A

$y - y_1 = m(x - x_1)$

$y - 4 = 2(x - 3)$

③ Standard Form.

$y - 4 = 2x - 6$ +4

$0 = 2x - y - 2$

Do #39, 40 on the boards.

43 $(0.3, 0.4)$ and $(0.5, 0.7)$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0.7 - 0.4}{0.5 - 0.3} = \frac{0.3}{0.2} = \frac{3}{2}$

$y - y_1 = m(x - x_1)$

$2(y - 0.7) = \frac{3}{2}(x - 0.5)$

10 $(2y - 1.4 = 3x - 1.5)$

$20y - 14 = 30x - 15$

$0 = 30x - 20y - 1$

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