Lesson: Slope-Intercept and Standard Form of Linear Equations

Slope-Intercept Form: y = mx + b, where m = slope and b = y-intercept

Standard Form: ax + by = c, where a, b, and c are constants

Examples:

1. Given m = -4 and b = 7, what is the slope-intercept form of the equation?

Y = -4x + 7

1. Given: (3, -1), m = -3, what is the slope-intercept form of the equation?

Y = -3x + b, from the (x, y) coordinates we know x = 3 and y = -1

-1 = -3(3) + b

-1 = -9 + b

+9 +9

8 = b Therefore y = -3x + 8.

1. Given (2, 8) and the line is parallel to y = 3x + 2, what is the slope-intercept form of the equation?

Parallel lines have the same slope.

Y = 3x + b, from the (x, y) coordinates we know x = 2 and y = 8

8 = 3(2) + b

8 = 6 + b

-6 -6

2 = b Therefore y = 3x + 2 which is the same line, so it is called a coincident line. It’s solution is all numbers on that line.

1. Given (3, 8) and the line is perpendicular to y = 3x + 1, what is the slope-intercept form of the equation?

The perpendicular lines have slopes that are the negative inverse of each other---if the slope is m, the perpendicular slope is -1/m.

Y = -1/3x + b, from the (x, y) coordinates we know x = 3 and y = 8

8 = -1/3(3) + b

8 = -1 + b

+1 +1

9 = b Therefore y = -1/3x + 9.

1. Given (-1, 3) and (2, 9), what is the slope-intercept form of the equation?

m = y2 - y1 = 9 – 3 = 6 = 2

x2 – x1 2 - -1 3

y = 2x + b, from the (x, y) coordinates we know x = -1 and y = 3

3 = 2(-1) + b

3 = -2 + b

+2 +2

5 = b Therefore y = 2x + 5.

What if we use the other point, (2, 9)?

9 = 2(2) + b

9 = 4 + b

-4 -4

5 = b Therefore y = 2x + 5 again!

So it doesn’t matter which point you choose.

1. Write y = 2/3x + 7 in standard form.

y = 2/3x + 7

-2/3x -2/3x

-2/3x + y = 7

Multiply all the terms by 3.

3(-2/3x + y) = (7)3

-2x + 3y = 21 is the standard form.