AA Notes – Section 5.5 – Standard Form

Review: *Slope:* $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ *remember to label points (x_1, y_1) (x_2, y_2)

Slope-Intercept Form: **y = mx + b**   *m is slope, b is the y-intercept

Graphing from slope-intercept form: plot the y-intercept first, then count the slope (rise over run) and plot the second point, continue counting the slope to plot four points when they will fit on the graph provided; draw a line with a ruler and arrows.

Point-Slope Form: **y – y₁ = m (x – x₁)**   *m is slope, *point (x₁, y₁)*

Graphing from point-slope form: plot the point first, then count the slope (rise over run) and plot the second point, continue counting the slope to plot four points when they will fit on the graph provided; draw a line with a ruler and arrows.

New material:

The standard form of a linear equation is $\underline{Ax + By = C}$ **, where A, B, and C are real numbers, and A and B are not zero.**

Just as we converted equations to slope-intercept form, we will be converting equations to standard form. A few things to keep in mind when writing equations in standard form:

- Standard from cannot have any fractions or decimals
- The lead coefficient (the first one/the x term) should be positive (change all the signs when necessary by multiplying or dividing all terms by – 1)

Examples:

Write the following equations in standard form:

1.   y = 2x + 3
    -2x   -2x
    $\dfrac{-2x + y = 3}{-1 \quad -1 \quad -1}$
    $\boxed{2x - y = -3}$

2.   y = – x – 4
    +x   +x
    $\boxed{x + y = -4}$

3.   y = 3x + 15
    -3x   -3x
    $\dfrac{-3x + y = 15}{-1 \quad -1 \quad -1}$
    $\boxed{3x - y = -15}$

4.   y = – 4x
    +4x   +4x
    $\boxed{4x + y = 0}$

5. $-7x = 9y - 3$ 6. $-4x + 5y = 10$ 7. $6y = -2x + 7$ 8. $x = 7y + 1$

5. $\quad -9y \quad -9y$

$\dfrac{-7x - 9y}{-1} = \dfrac{-3}{-1}$

$\boxed{7x + 9y = 3}$

6. $\dfrac{-4x + 5y}{-1} = \dfrac{10}{-1}$

$\boxed{4x - 5y = -10}$

7. $+2x \quad +2x$

$\boxed{2x + 6y = 7}$

8. $-7y \quad -7y$

$\boxed{x - 7y = 1}$

Write the following equations in standard form using integers (meaning no fractions or decimals); we get rid of the fractions by multiplying every term by a common denominator; we get rid of decimals by multiplying by the factor of 10 that applies to that equation.

9. $y = \dfrac{2}{3}x - 5$

$-\dfrac{2}{3}x \quad -\dfrac{2}{3}x$

$-3 \cdot \left(-\dfrac{2}{3}x + y = -5\right)$

$\boxed{2x - 3y = 15}$

10. $y = -\dfrac{1}{5}x + 2$

$+\dfrac{1}{5}x \quad +\dfrac{1}{5}x$

$5 \cdot \left(\dfrac{1}{5}x + y = 2\right)$

$\boxed{x + 5y = 10}$

11. $y = \dfrac{1}{3}x - \dfrac{3}{4}$

$-\dfrac{1}{3}x \quad -\dfrac{1}{3}x$

$-12 \cdot \left(-\dfrac{1}{3}x + y = \dfrac{-3}{4}\right)$

$\boxed{4x - 12y = 9}$

12. $\overset{10}{\left(1.2x + 0.3y = 5.4\right)}$

$\boxed{12x + 3y = 54}$

13. $\overset{-100 \cdot}{\left(-0.3x + 2y = 0.25\right)}$

$\boxed{30x - 200y = -25}$

14. $\overset{1000}{\left(4.2x + 6y = .125\right)}$

$\boxed{420x + 6000y = 125}$