GUIDED NOTES – 2.2 LINEAR EQUATIONS IN ONE VARIABLE

LEARNING OBJECTIVES

In this section, you will:

- Solve equations in one variable algebraically.
- Solve a rational equation.
- Find a linear equation.
- Given the equations of two lines, determine whether their graphs are parallel or perpendicular.
- Write the equation of a line parallel or perpendicular to a given line.

SOLVING LINEAR EQUATIONS IN ONE VARIABLE

- A linear equation in one variable is one that can be written in the form _____. The defining features of such an equation is that they only involve a variable of power _____, and when graphed they yield a straight _____.

Try It: Read Example 1 in the text, then answer the following.

Solve the linear equation in one variable.

$$2x + 1 = -9$$

Try It: Read Example 2 in the text, then answer the following.

Solve the linear equation in one variable.

$$-2(3x - 1) + x = 14 - x$$

Homework: *You should now be ready to attempt problems 1-3 in "Homework – Algebra 2.2" on WeBWorK.*

SOLVING A RATIONAL EQUATION

- The key to solving a rational equation is to "clear" the fractions by multiplying both sides of the equation by the _____.

Try It: Read Example 4 in the text, then answer the following.

Solve the rational equation.

$$\frac{2}{3} = \frac{x}{4} - \frac{1}{6}$$

Try It: Read Example 5 in the text, then answer the following.

Solve the rational equation. State the excluded values.

$$-\frac{5}{2x} + \frac{3}{4x} = -\frac{7}{4}$$

Homework: *You should now be ready to attempt problems 4-5 in "Homework – Algebra 2.2" on WeBWorK.*

FINDING A LINEAR EQUATION

- Give the formula for the slope of a line through two points, (x_1, y_1) and (x_2, y_2).

Try It: Read Example 8 in the text, then answer the following.

Find the slope of the line that passes through the points $(-2, 6)$ and $(1, 4)$.

- Give formulas for the following three forms of a linear equation in two variables.
  - Slope-Intercept Form:
  - Point-Slope Form:
  - Standard Form:

Try It: Read Example 10 in the text, then answer the following.

Given $m = 4$, find the equation of the line in slope-intercept form passing through the point $(2, 5)$.

Try It: Read Example 12 in the text, then answer the following.

Find the equation of the line in standard form with slope $m = -\frac{1}{3}$ and passing through the point $\left(1, \frac{1}{3}\right)$.

Try It: Read Example 13 in the text, then answer the following.

Find the equation of the line passing through $(-5, 2)$ and $(2, 2)$.

Homework: *You should now be ready to attempt problems 8-11 in "Homework – Algebra 2.2" on WeBWorK.*

WRITING THE EQUATIONS OF LINES PARALLEL OR PERPENDICULAR TO A GIVEN LINE

Try It: Read Example 15 in the text, then answer the following.

Find the equation of the line parallel to $5x = 7 + y$ and passing through the point $(-1, -2)$.

Homework: *You should now be ready to attempt problems 12-15 in "Homework – Algebra 2.2" on WeBWorK.*

REVIEW QUESTIONS

Answer the following questions in your own words.

1. What is the relationship between the slopes of perpendicular lines (assuming neither is horizontal nor vertical)?

2. When solving the following equation: $\frac{2}{x-5} = \frac{4}{x+1}$, explain why we must exclude $x = 5$ and $x = -1$ as possible solutions from the solution set.