**Learning Targets**

* I can identify linear equations, intercepts, and zeros.
* I can create a table of values by plugging in x-values to the equation to find the corresponding y-values.
* I can convert an equation into slope-intercept form.
* I can graph linear equations using a table.

**What is a Linear Equation?**

* An equation that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when it is graphed.

|  |
| --- |
| **Two Common Linear Equation Forms** |
| **Standard Form** |  |
| **Slope Intercept Form** |  |

[Example] Choose all Linear Equations.

A. 3x +5y = 10 B. y = 2x-1 C. x2 + 2x – 3 = 0 D. y = x3 E. 6x – xy = 4

F. $y= \frac{2}{3}x$ G. $y= \frac{5}{x}$ H. y = 3 I. x = 5 J. y = x

**How to graph a Linear Equation?**

|  |  |
| --- | --- |
| **Standard Form** | **Slope Intercept Form** |
| 1. Plug in \_\_\_\_\_to find the y-intercept
2. Plug in \_\_\_\_\_ to find the x-intercept
3. Connect x-intercept and y-intercept
 | 1. Solve for y (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)2. Complete the table or do a \_\_\_\_\_\_\_\_\_* + Quick draw: plot a y –intercept then follow the slope
 |

**[Example] Graph 2x + 4y = 16**

 Standard Form Slope Intercept Form

1. Plug in x = 0 to find the y-intercept 1. Solve for y (meaning isolate y)

2. Plug in y = 0 to find the x-intercept 2. Complete the table or do a quick draw

3. Connect x-intercept and y-intercept

|  |  |
| --- | --- |
| x | y |
| -4 |  |
| -2 |  |
| 0 |  |
| 2 |  |
| 4 |  |

****

**How Does a Table Work?**

Starting Equation: $y+3=2x$

**Step 1: Get** $y$ **by itself.**

**Step 2: Plug in values for** $x$ **to find** $y.$

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ | ***Work Shown*** |  |
| ***-2*** |  |  |  |
| ***-1*** |  |  |  |
| ***0*** |  |  |  |
|  |  |  |  |

**Step 3: Plot Points from Table on Graph**

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**Write each linear equation in slope-intercept form (get y by itself).**

 Why is it important to get y by itself? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) $\frac{2}{3}x+y=7$ b) $-9x=18+6y$

c) $5y=3x+25$ d) $-\frac{1}{2}x+\frac{2}{3}y-8=0$

**Examples: Complete the table for each function, then graph**

a) $y=-3x+8$

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$x$$ |  |  |  |  |  |
| $$y$$ |  |  |  |  |  |

b) $y-6=-3(x+2)$



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$x$$ |  |  |  |  |  |
| $$y$$ |  |  |  |  |  |

c) $\frac{8}{3}x-\frac{4}{3}y=-4$



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$x$$ |  |  |  |  |  |
| $$y$$ |  |  |  |  |  |

**Graphing Vertical and Horizontal Lines**

**Let’s memorize: HOY VUX**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Graph Example** | **Slope** | **Equation** |
| **Horizontal Line** |  | m =  |  |
| **Vertical Line** |  | m =  |  |

Graph each equation on the provided coordinate plane.

a) $y=6$ b) $y=-1$ c) $x=3$



d) $x=-2$ e) $y+5=0$ f) $x-3=-1$



**Application**

a) Determine which ordered pair in the table does not belong to the equation.

 $y=-4x+3$

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$x$$ | -2 | -1 | 0 | 1 | 2 |
| $$y$$ | 11 | 8 | 3 | -1 | -5 |

b) Determine which ordered pair in the table does not belong to the graph.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$x$$ | -8 | -4 | 0 | 4 | 8 |
| $$y$$ | 0 | 2 | 7 | 6 | 8 |

c) Prove that $(-4, -7)$ is a solution to the equation $y=\frac{1}{2}x-5$

 i) Prove graphically ii) Prove algebraically



**Extra Practice**

* Textbook p. 155-159, 216-219, 233-235