**Linear Functions**

**Equation**: y = mx + b

 m = slope

 average rate of change

 $\frac{y\_{2}-y\_{1}}{x\_{2}-x\_{1}}$

 b = y-intercept

 (0, \_\_\_)

**Table**:

The x, and y values have a constant rate of change that is using addition/subtraction.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | -1 | 0 | 1 | 2 | 3 |
| y | -5 | -8 | -11 | -14 | -17 |

**Finding the Equation:**

 Calculate the average rate of change for 2 points:

 (1, -11) (2, -14)

 $\frac{-14-\left(-11\right)}{2-1}=\frac{-3}{1}=-3$

 What is the y-intercept?

 (0, -8)

 What is the equation?

y = -3x – 8

**Exponential Functions**

**Equation:** y = a(b)x

 a = initial value

 y-intercept

 (0, \_\_\_)

 b = growth/decay factor

 what you are multiplying by

 $\frac{y\_{2}}{y\_{1}}$

**Table:**

 The x value will have a constant rate of change. The y value is increasing/decreasing by a multiplying factor.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | -3 | -2 | -1 | 0 | 1 |
| y | $$\frac{1}{8}$$ | $$\frac{1}{4}$$ | $$\frac{1}{2}$$ | 1 | 2 |

**Finding the Equation:**

 Calculate the growth rate:

 $\left(-2,\frac{1}{4}\right)$ $\left(-1,\frac{1}{2}\right)$

 $\frac{y\_{2}}{y\_{1}}=\frac{^{1}/\_{2}}{^{1}/\_{4}}=2$

 What is the y-intercept?

 (0, 1)

 What is the equation?

 y = 1(2)x