**5.7 – Interpreting Graphs of Linear Functions**

Any graph of a line that is not vertical represents a linear function.

**Vocabulary:**

x-intercept (horizontal intercept): the x-coordinate of the point where a graph intersects the x-axis

y-intercept (vertical intercept): the y-coordinate of the point where a graph intersects the y-axis

**Determining the x-intercept and y-intercept:**

To find the *x*-intercept, evaluate *f(x) = 0*; that is find *x* when *y = 0*. The coordinates are (*n*, 0).

To find the *y*-intercept, evaluate *f(0)*; that is, evaluate *f(x)* when *x = 0*. The coordinates are (0, *n*).

**Example 1: Finding Intercepts, Domain, and Range of a Linear Function**

Find the x-intercept, y-intercept, domain and range of the following linear function.



x-intercept:

y-intercept:

Domain:

Range:

**Example 2: Sketching a Graph Using Intercepts**

Sketch the graph: *f(x) = −3x + 4*

x-intercept:

y-intercept:

Then, find the coordinate of another point on the graph.

Point A:

**Example 3: Matching a Graph to a Given Rate of Change and Vertical Intercept**

Which graph has a rate of change of 4 m/h and a vertical intercept of 3-m? Justify your answer.



A) Rate of change: Vertical Intercept:

B) Rate of change: Vertical Intercept:

C) Rate of change: Vertical Intercept:

D) Rate of change: Vertical Intercept:

Answer: B); it has a y-intercept of 3-m and a slope of 4 m/h.

**Example 4: Solving a Problem Involving a Linear Function**

The graph shows the cost of hosting an anniversary party. What is the maximum number of people that can attend the party for a cost of $1500?



**Method 1: Use Graph**

Find 1500 on the vertical axis and use a ruler to draw a line until it connects with the line on the graph. Mark a point and then draw a vertical line from this point to the horizontal axis. Read this value.

**Method 2: Use a Linear Equation**

First, find the rate of change.

Then, use the y-intercept to create the linear equation: *C = 18n + 900*

Solve the linear equation by substituting $1500 for *C*.