Objectives

- Graph Linear functions
- Find a linear function given a data set.
- Classify a function as being a linear function, an absolute value function, a quadratic function, another polynomial function, or a rational function.
- Determine the range of a function from its graph.

1.   Graph.

   a) $x = 3$ b) $f(x) = {}^-4$ c) $f(x) = 2x + 3$

2.   A taxi ride in New York City costs \$3 plus \$2 per mile. Formulate a linear function to model the cost, $C(m)$, of an $m-$mile taxi ride, and find the mileage traveled when the cost is \$25.

3.   The population in Smallville was 1100 in 2000 and 800 in the year 2008. Assume a constant rate of change exists. Let $P(t)$ represent the population of Smallville, and t be the number of years after the year 2000.

   (a) Find a linear function that fits the data.

   (b) use the function from part (a) to predict Smallville's population in 2015.

4.   Classify each function as being a linear function, an absolute value function, a quadratic function, another polynomial function, or a rational function. Also, determine the domain of each function.
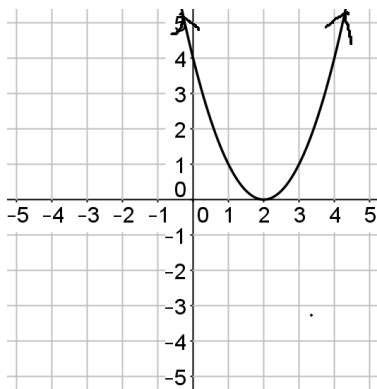
   a) $f(x) = x^2 - 1$ b) $h(x) = {}^-4$ c) $g(x) = 2x + 3$ d) $f(x) = x^2 - 1$

   e) $p(n) = \left|2n - 1\right|$ f) $g(t) = \dfrac{2t + 3}{t}$ g) $f(t) = 10 - 0.2t$

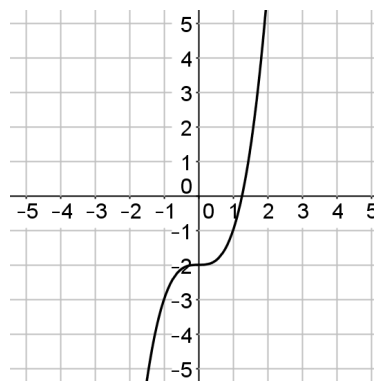5.   Given the graph of each function, determine the range of f.
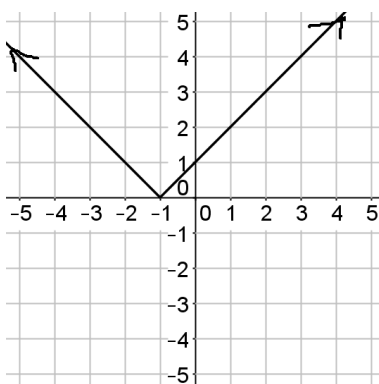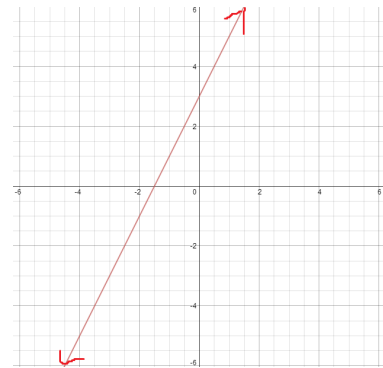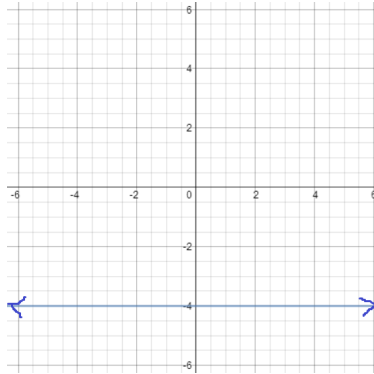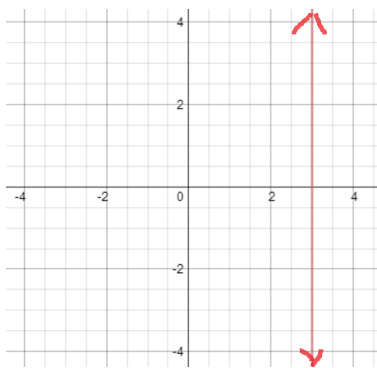

$$f(x) = |x + 1| \qquad f(x) = (x - 2)^2 \qquad f(x) = x^3 - 2$$

Answers: 1abc (see graphs below)

2) $C(m) = 3 + 2m$; $m = 11$ miles   3a) $P(t) = 37.5t + 1100$, 3b) 538 people, 4a) quadratic function, b) linear function, constant function, c) linear function, d) quadratic function, e) absolute value function, f) rational function, g) linear function, 5a) $\text{rng}(f) = [0, \infty)$, b) $\text{rng}(f) = [0, \infty)$, c) $\text{rng}(f) = (-\infty, \infty)$