

Section 2.1: Functions

Definition: A function is a rule that assigns each element in set A (independent Values) to one and only one element in set B (dependent values).

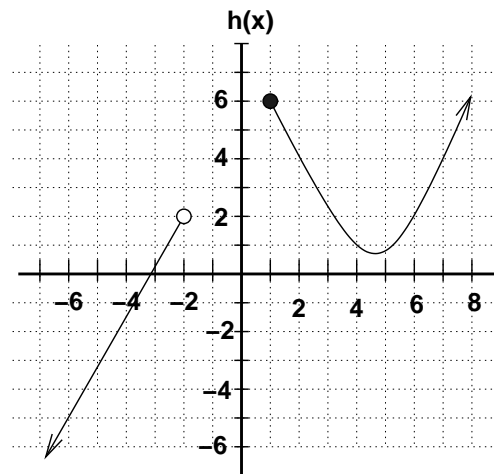
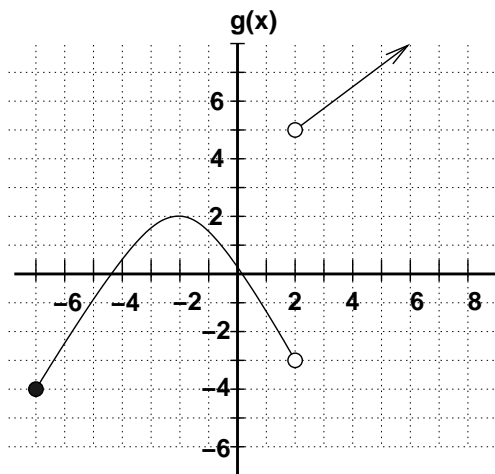
Examining Graphs:

Vertical Line Test: If any vertical line hits a graph in more than once, then the graph is not a function.

Domain:

Range:

Example: Determine if each of these graphs is a function. If it is a function, then give the domain and the range.



Example: Use the graph of $f(x)$ to answer these questions.

$$f(6) =$$

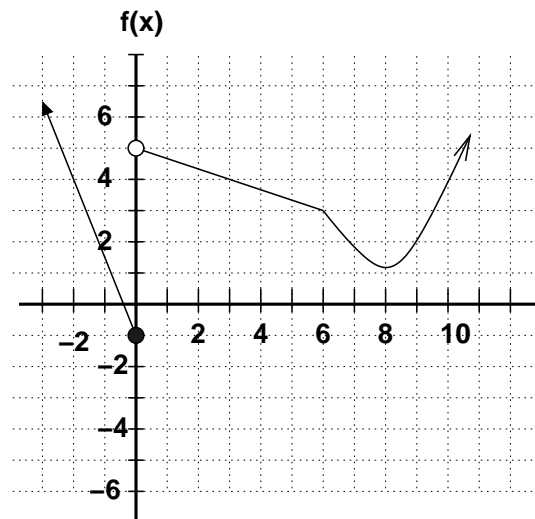
$$f(0) =$$

$$f(8) =$$

$$f(5) =$$

Find the values of x where $f(x) = 4$.

Find the values of x where $f(x) > 4$.



Examining Formulas:**Polynomials:**

$$y = x^2 + 3x - 4$$

$$y = x^{81} - 32.874x^{27} + \frac{3}{7}x^{10} + 37.8x + 16$$

Rational Functions:

$$y = \frac{x^2 - 1}{x^2 - 4}$$

$$y = \frac{x + 2}{x^2 - 5x - 24}$$

$$y = \frac{1}{x^2 + 9}$$

Roots:

$$y = \sqrt{10 - x}$$

$$y = \sqrt{3x + 7}$$

$$y = \sqrt[3]{2x - 5}$$

Mixed Forms:

$$y = \sqrt[3]{\frac{1}{x}}$$

$$y = \frac{\sqrt{x+2}}{3x^2 - 11x - 4} = \frac{\sqrt{x+2}}{(3x+1)(x-4)}$$

Evaluation:

For these functions, compute the following. $f(x) = -x^2 + 7$

$$g(x) = 2x^2 + 3x + 1$$

$$f(2) =$$

$$g(a + h) =$$

$$g(a + h) - g(a) =$$

Example: A local company makes A& M flashlights and sells each of them for \$185. The company has a fixed cost of \$37,800 and a variable cost of \$35 per flashlight. Let x is the number of flashlights made and sold.

- Find the cost, revenue and profit functions.
- How many flashlights should be made and sold when the company breaks even?
- What is the break even point?

Example: The price-demand function for a product is $p = -0.014x + 376$, where x is in number of items and p is given in dollars. Find the revenue function for this product.