

WORKSHEET: REVIEW OF FUNCTIONS

Goals:

- How to think about and use function notation and terminology.
- A list of functions to know.
- Some practice putting these together.

1. The notation $y = f(x)$ means

2. Let $f(x) = 10 - 3x^2$. Expand the expressions below and collect like terms.

(a) $f(5)$

(d) $f(x + h)$

(b) $f(3a)$

(e) $f(x) + h$

(c) $2[f(a)]^2$

3. Below is a list of expressions you should be able to graph instantly. Your graphs should always include any x - and y -intercepts, asymptotes, and clearly indicate end behavior.

$$y = x, \quad y = \mathbf{b}, \quad x = a, \quad y = x^2, \quad y = x^3, \quad y = \frac{1}{x}, \quad y = \frac{1}{x^2}, \quad y = \sqrt{x}, \quad y = \sqrt[3]{x}$$
$$y = |x|, \quad y = e^x, \quad y = 2^x, \quad y = e^{-x}, \quad y = \ln x, \quad y = \log_{10}(x)$$

Include domain and range!

Some Extra Practice

4. Write the equation of the line through the point $(2, -5)$ that is parallel to the line $4x + 3y = 17$.

5. Find the domain and range of $f(x) = 4 + \sqrt{11 - x}$. Give your answers in interval notation. Explain how you got your answer.

6. Sketch the graph of $f(x) = \begin{cases} e^x & x \leq 0 \\ 3 - x^2 & 0 < x \end{cases}$

7. Determine any x - or y -intercepts for the graphs below.

(a) $g(x) = 2x^2 + 13x - 7$

(b) $h(x) = \frac{a}{x-b}$ (Assume a and b are fixed positive constants.)

8. Bonus: Sketch the functions g and h from the previous problem.