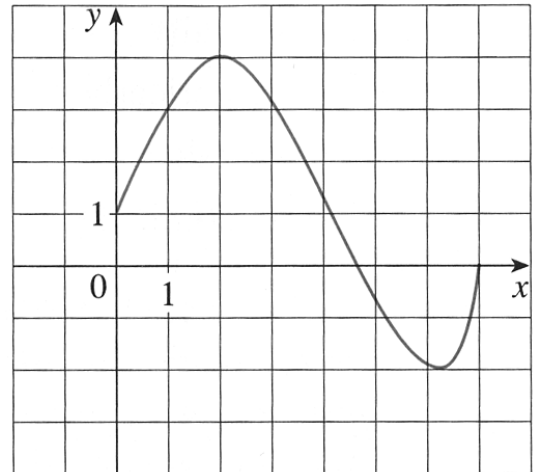


## WORKSHEET: REVIEW OF FUNCTIONS

1. The graph of a function  $f$  is shown below. Find the following:

- a)  $f(1)$  and  $f(5)$
- b) the domain of  $f$
- c) the range of  $f$
- d) For which value(s) of  $x$  is  $f(x) = 2$ ?
- e) Where is  $f$  increasing?



2. Let  $f(x) = 5 - 3x^2$ . Find and simplify the following expressions. Are (b) and (c) different?

(a)  $f(3)$

(b)  $f(a^2)$

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

(d)  $\frac{f(x+h) - f(x)}{h}$

3. Find the domain and range of each of the following functions. Use interval notation.

(a)  $f(x) = \frac{1}{x^2 - 5}$  (The range is tricky. Look for  $y$ -values that are *not* possible.)

(b)  $f(x) = \sqrt{11 - x}$

(c)  $g(x) = 8.245e^x$

4. Graph the piecewise defined function.

$$f(x) = \begin{cases} 4 & \text{if } x \leq -1 \\ x^2 & \text{if } x > -1 \end{cases}$$

5. Give a rough sketch of each of the following functions. What do you think are the crucial properties to illustrate? What are the important points, if any?

(a)  $f(x) = \frac{1}{x}$

(b)  $f(x) = \frac{1}{x^2} + 1$

(c)  $f(x) = \ln(x)$

(d)  $f(x) = \sin(x)$

6. Explain in your own words what is meant by the inverse of the function  $f(x)$ ?