Chapter 2 Test Review: TO RECEIVE CREDIT, ALL PROBLEMS MUST BE DONE ON SEPARATE PAPER, SHOWING ALL WORK, AND TURNED AT THE BEGINNING OF CLASS ON TEST DAY.

1) Determine whether the equation defines y as a function of x.

a) $y = \frac{1}{x}$

c) $y = \frac{4x-1}{x}$

e) $y^2 + x = 4$

b) $y^2 = 4 - x^2$

d) $8x + x^2 - 59 = y$

2) Find the value for the function.

a) Find f(4) when $f(x) = x^2 + 5x - 1$

b) Find f(2) when $f(x) = \frac{x^2-3}{x-1}$

c) Find f(2x) when $f(x) = \sqrt{7x^2 - 3x}$

d) Find $f(x + h)$ when $f(x) = 3x^2 - 4x - 4$

e) Find $f(x - 2)$ when $f(x) = 3x^2 + 5x + 3$

3) The function $P(d) = 1 + \frac{d}{33}$ gives the pressure, in atmospheres (atm), at a depth d feet in the sea. Find the pressure at 55 feet.

4) Find the domain of the function. Answer in **Interval notation**.

a) $f(x) = \frac{x}{x^2+5}$

b) $h(x) = \frac{x-3}{x^3-25x}$

c) $f(x) = \sqrt{10 - x}$

d) $g(x) = \frac{x}{\sqrt{x+7}}$

5) For the given functions f and g, find the requested function and state its domain. Answer in **Interval notation**.

a) $f(x) = 9 - 6x;$ $g(x = -2x + 6$ Find $f +$ g.

b) $f(x) = 6x - 7;$ $g(x) = 9x-8$ Find $f - g.$

c) $f(x) = 2x - 4;$ $g(x) = 9x-2$ Find $f \cdot g.$

d) $f(x) = 5x + 1;$ $g(x) = 6x-5$ Find $\frac{f}{g}.$

e) $f(x) = 2x^3 - 1,$ $g(x) = 4x^2 - 3$ Find $f \cdot$ g.

f) $(x) = \sqrt{x};$ $g(x) = 5x-2$ Find $\frac{f}{g}..$

g) $f(x) = \sqrt{x + 5};$ $g(x) = \frac{2}{x}$ Find $f \cdot$ g.

h) $f(x) = 3x + 5;$ $g(x) = 4x-1$ Find $\frac{f}{g}..$

6) Find and simplify the difference quotient of $f(x)$, $\frac{f(x+h)-f(x)}{h}$ $h \neq 0$, for the following functions.

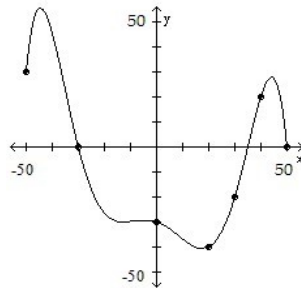a) $f(x) = 7x + 8$

b) $f(x) = 2x^2$

c) $f(x) = 5x + 1$

7) The graph of a function f is given. Use the graph to answer the question. Use the graph of f given below to find
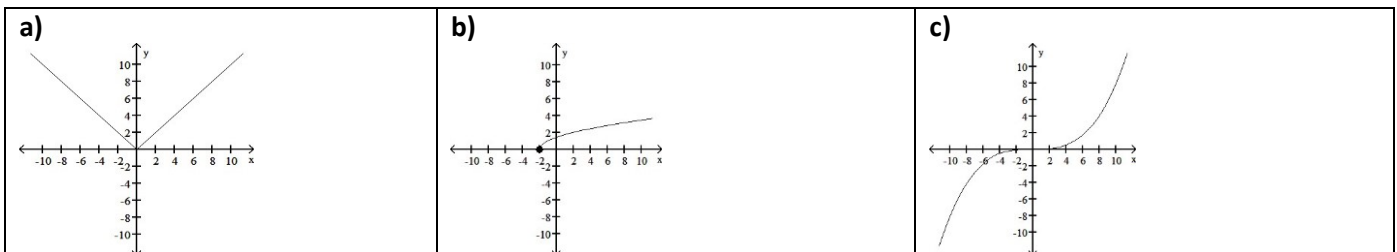
a) $f(20)$.

b) Is $f(-50)$ positive or negative?

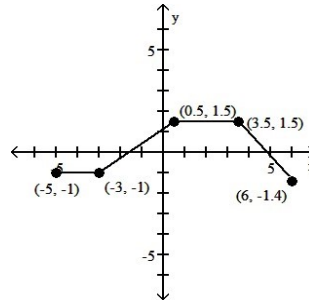c) What is the domain of f?

d) For what numbers is $f(x) \leq 0$?

8) The graph of a function is given. Decide whether it is even, odd, or neither
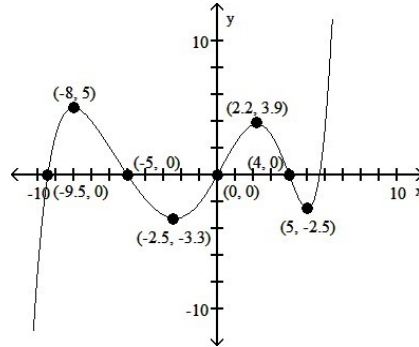
a)	b)	c)

9 The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.
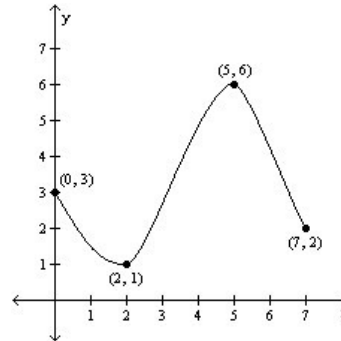
a) $(-3, 0.5)$ b) $(0.5, 3.5)$ c) $(3.5, 6)$

10) Find the numbers, if any, at which f has a local maximum and/or a local minimum.

What are the local maxima and minima?

11) For the graph of the function $y = f(x)$, find the absolute maximum and the absolute minimum, if it exists.

12) Find the average rate of change for the function between the given values.
$$f(x) = x^2 + 7x; \quad \text{from } 1 \text{ to } 5$$

13) Graph the function.

a) $f(x) = \begin{cases} x + 1 & -7 \leq x < 5 \\ -7 & if \quad x = 5 \\ -x + 8 & if \quad x > 5 \end{cases}$ b) $f(x) = int \ (x + 1)$ c) $f(x) = \begin{cases} 1 & if \ x < 0 \\ \sqrt{x} & if \ 0 \leq x \leq 4 \\ x - 5 & if \ 4 < x \end{cases}$

14) Write the equation of a function that has the given characteristics.
a) The graph of $y = x^2$, shifted 6 units upward
b) The graph of $y = |x|$, shifted 8 units left
c) The graph of $y = \sqrt{x}$, shifted 7 units to the right

15) Graph the function by starting with the graph of the parent function and then using the techniques of shifting, compressing, stretching, and/or reflecting.
    a) $f(x) = (x + 3)^2 + 3$ **b)** $f(x) = 2x^2$ **c)** $f(x) = 3(x + 1)^2 - 2$

16) Use the graph of $f(x) = x^2$ to sketch the graph of the indicated equation.
$$y = -\frac{1}{3}(x + 5)^2 + 2$$