

1) Given $f(x) = -2x^2 + 3x$ find each of the following:

$f(-3)$; $f(2)$; $f(-a)$; $f(a+h)$

2) Determine whether the functions are one-to-one....

a) $f(x) = -3x + 5$

b) $f(x) = |x - 3|$

3) Find the domain of each, express answers in interval notation

a) $f(x) = \frac{x+1}{3x+2}$

b) $f(x) = \frac{5}{x^2 - 4x - 12}$

c) $f(x) = \sqrt{6-3x}$

4) Graph the piecewise function: $f(x) = \begin{cases} x+1 & \text{for } x < -2 \\ -2x-3 & \text{for } x \geq -2 \end{cases}$

5) Find the average rate of change for $f(x) = 10x^2 + x$

a) From $x = 1$ to $x = 2$

b) from $[4, 4+h]$

6) Given $f(x) = 3x + 2$ and $g(x) = 5 - 6x$ find each:

a) $(f \circ g)(x)$

b) $(g \circ g)(x)$

7) Given $f(x) = x + \frac{1}{x+4}$ and $g(x) = \frac{1}{x}$ find $(f \circ g)(x)$

8) Using transformations sketch a graph of the given functions:

a) $f(x) = (x-3)^2$

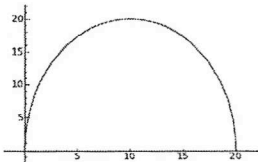
b) $f(x) = -|x+4| + 3$

c) $f(x) = \sqrt{x} + 5$

9) Given the graph of $f(x)$, sketch the graph of each:

a) $g(x) = f(x+10)$

b) $g(x) = -\frac{1}{2}f(x)$



10) Solve the absolute value equations:

a) $|x+4| = 18$

b) $2|x-1| - 5 = 9$

11) Solve the inequalities and graph on a number line, state the solution in interval notation:

a) $|3x-2| < 7$

b) $\left| \frac{1}{3}x + 2 \right| \geq 5$

12) Find the inverse $f^{-1}(x)$ of each.

a) $f(x) = 9 + 10x$

b) $f(x) = \frac{x}{7x+2}$

13) Find a linear equation for the line that passes through (7,5) and (3,17)

14) determine whether the lines are parallel, perpendicular or neither:

$$2x - 6y = 12$$

$$-x + 3y = 1$$

15) Find the x and y intercepts of $7x + 9y = -63$

16) Write an equation for the line perpendicular to $y = 5x - 1$ and contains the point (5, 20)

17) In 2004 a school population was 1700, by 2012 the population was 2,500. Assume the population is growing linearly.

- a) Find an equation for the population P, of the school t years after 2000.
- b) What is the average population growth per year?
- c) Predict the school population in 2018.

18) Find the point of intersection for the 2 linear functions:

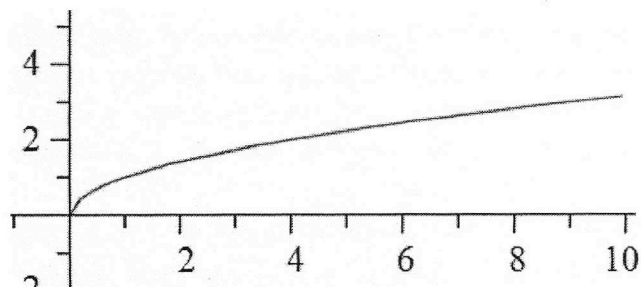
$$x = y + 6$$

$$2x - y = 13$$

19) Graph the function $f(x) = -x^4 + 4x^3 - 20$ State where f(x) is increasing and decreasing. State any absolute extrema (if they exist). Determine the Domain and Range.

20) Graph $f(x) = x^3 - 9x^2 + 24x$ state any relative (local) extrema. Find any zeros of f(x)

21) Given the one-to-one function below. Sketch the graph of the inverse.

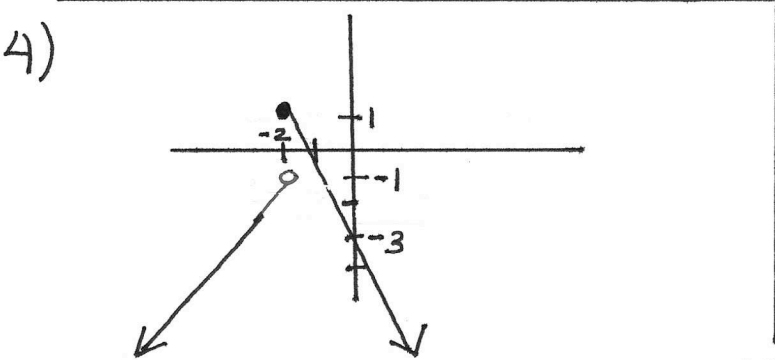


170 EXAM REVIEW 1 SOLUTIONS:

1) $f(-3) = -27, f(2) = -2, f(-a) = -2a^2 - 3a, f(a+h) = -2a^2 - 4ah - 2h^2 + 3a + 3h$

2) a) yes one to one (linear)
 b) not one to one (graph is a "V" does not pass horizontal line test)

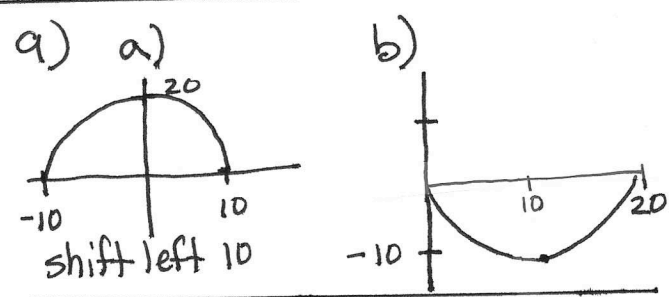
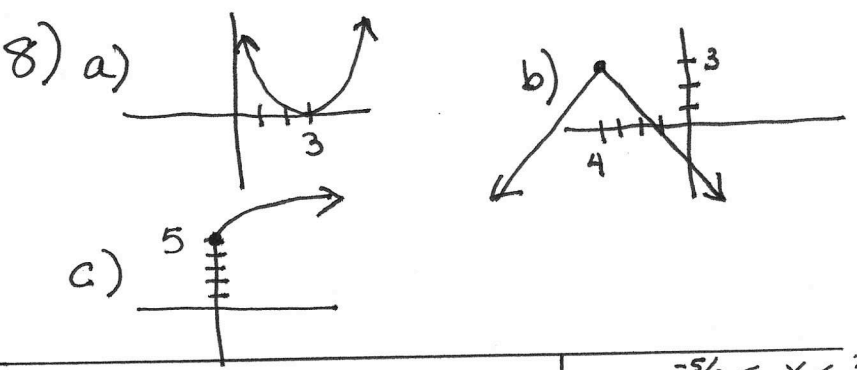
3) a) $x \neq -2/3$
 $(-\infty, -2/3) \cup (-2/3, \infty)$
 b) $x \neq 6, x \neq -2$
 $(-\infty, -2) \cup (-2, 6) \cup (6, \infty)$
 c) $x \leq 2$
 $(-\infty, 2]$



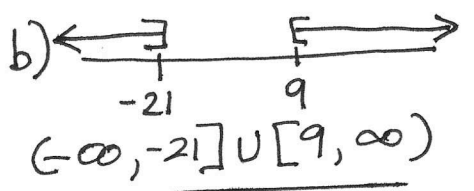
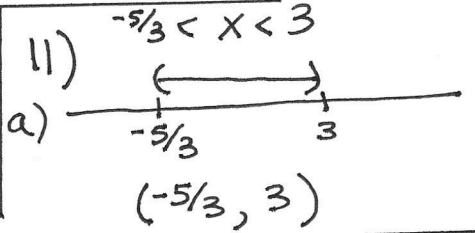
5) a) $\frac{42-11}{2-1} = \frac{31}{1} = \boxed{31}$
 b) $\frac{10(4+h)^2 + (4+h) - (10(4)^2 + 4)}{4+h-4} = \frac{81h+10h^2}{h}$
 $= \boxed{81+10h}$

6) a) $(f \circ g)(x) = 17 - 18x$
 b) $(g \circ f)(x) = 36x - 25$

7) $(f \circ g)(x) = \frac{(\frac{1}{x})+1}{(\frac{1}{x})+4} = \frac{1+x}{1+4x}$
 (mult. num & den by x)



10) a) $x = 14, -22$
 b) $x = 8, -6$



12) a) $f(x) = \frac{x-9}{10}$
 b) $f^{-1}(x) = \frac{2x}{1-7x}$

13) $y = -3x + 26$ | 14) parallel, both slopes are $\frac{1}{3}$

15) x-int $(-9, 0)$ y-int $(0, -7)$ | 16) $y = -\frac{1}{5}x + 2$

17) a) $P = 100t + 1300$
 b) grow per year = 100 studs
 c) 3100 students

18) $(7, 1)$
 20) Local Max $(2, 20)$
 Local Min $(4, 16)$
 zero at $(0, 0)$

19) Fnc. $(-\infty, 3)$ dec $(3, \infty)$
 abs max is 7 occurs at $x = 3$
 domain $(-\infty, \infty)$ range $(-\infty, 3]$
 21)
 switch ordered pairs