MAC 1140
LA session

Week 1

1. Given function $f(x) = -2x^2 + 4x - 1$, find and simplify the following

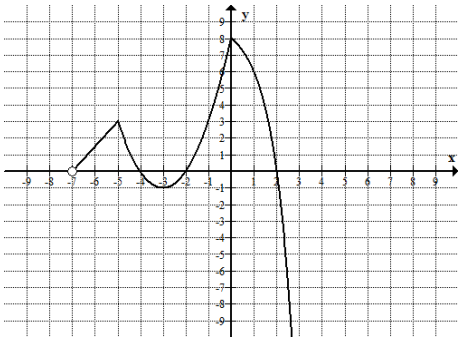
a) f(2)
b) f(-1)
c) f(0)
d) f(-x)
e) f(x + 1)
f) f(x+h)
g) f(2x)

2. Find the domain of the given function. Start by writing the condition(s) x must satisfy. Write your answer in the interval notation and the set builder notation

a) $f(x) = \dfrac{5x-8}{\sqrt{2x+3}-2}$

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

3. The graph of a function f(x) is given below. Answer the questions that follow.



a) What is the domain of f(x)?
b) What is the range of f(x)?
c) What are the x-intercepts, if any?
d) What is the y-intercept, if any?
e) List the intervals on which this function is increasing
f) List the intervals on which this function is decreasing?
g) For what values of x is f(x) > 0? Write the answer in the interval notation.
h) For what values of x is f(x) $\leq$ 0? Write the answer in the interval notation.
i) Is this an odd function? Explain why or why not.
j) Find the following values: f(2), f(-5), f(0), f(1)

4. Given two functions $f(x) = \dfrac{2x}{x+3}$ and $g(x) = \dfrac{3x+1}{x-2}$. Find and simplify the formula for the following functions and find their domains

a) $f+g$
b) $f \cdot g$
c) f / g

5. Find the intercepts of the following functions

a) $f(x) = x^2 + x - 1$

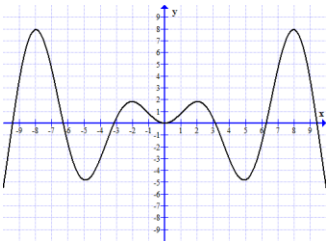
b) $f(x) = \dfrac{x^2-3}{\sqrt{2x+3}}$

6. Find the difference quotient for

a) $f(x) = -x^2 - 3x + 5$

b) $f(x) = \dfrac{3}{2x-1}$

7. Determine whether the following graph represents a function. Explain.



8. If $f(x) = \dfrac{2x - A}{3x + 4}$ and *f(1) =7*, what is the value of A?

9. Determine whether the function $f(x) = \dfrac{x}{2x^2 + 3}$ is even, odd or neither. If it is even or odd, explain what this information tells us about the graph of this function

10. For the given function, find f(-3), f(-1), f(0), f(2), f(5)

$$f(x) = \begin{cases} |x+1| & \text{for } x < -1 \\ \sqrt[3]{x} & \text{for } -1 \le x \le 3 \\ \dfrac{1}{x-3} & \text{for } x > 3 \end{cases}$$

11. Graph the following piecewise functions

a) $f(x) = \begin{cases} 3x - 4 & \text{for } x \le 1 \\ x^2 + 3 & \text{for } x > 1 \end{cases}$

b) $f(x) = \begin{cases} -3 & \text{for } x \le -2 \\ |x| & \text{for } -2 < x < 4 \\ \sqrt{x} & \text{for } x \ge 4 \end{cases}$