Math 203 Fall 2018 Professor MG
Classwork 1 Name: _____

Show all work and circle/box your final answer. All answers must be simplified unless stated otherwise.

REVIEW (optional)

1. (*0 points*) Use intervals to describe the real numbers satisfying the following inequalities:

(a) $2 \le x < 3$

(b) $x < 3$

2. (*0 points*) If $g(t) = t^3 - 3t^3 + t$, find $g(2)$ and $g(a)$

3. (*0 points*) Find the domain of the following functions

(a) $f(x) = \dfrac{3x-5}{x^2+x-6}$

(b) $\sqrt{2x+7} + \sqrt{x}$

4. (*0 points*) Let $f(x) = \begin{cases} \pi x^2 & , x < 2 \\ 1+x & , 2 \le x \le 2.5 \\ 4x & , x > 2.5 \end{cases}$ Find $f(1)$, $f(2)$, and $f(3)$.

5. (*0 points*) Graph the following: $y = 3x + 1$ and $y = -2x + 3$.

6. (*0 points*) In 2010, a patient paid \$700 per day for a semiprivate hospital room and \$1900 for an appendectomy operation. Express the total amount paid for an appendectomy as a function of the number of days of hospital confinement.

7. (*0 points*) Express $\dfrac{x}{x-8} - \dfrac{x}{x-4}$ as a rational function.

8. (*0 points*) Factor the following:

(a) $x^2 + 8x + 15$

(b) $x^2 - 16$

(c) $3x^2 + 12x + 12$

(d) $3x - x^2$

9. (*0 points*) Simplify the following expressions:

(a) $\left(\frac{x^4}{y^2}\right)^3$

(b) $\frac{-x^3y}{-xy}$

(c) $8^{4/3}$

(d) $16^{1/2}$

10. (*0 points*) Find the equations of the lines satisfying the following properties:

(a) Slope is -1; $(7,1)$ is on the line

(b) $(0,0)$ and $(1,0)$ is on the line

(c) Parallel to $y = 3x + 7$ and $(2,0)$ is on the line

(d) Perpendicular to $y = -x$ and $(2,0)$ is on the line

MAIN PROBLEMS

11. (*0 points*) Find the following limits:

(a) $\lim_{x\to 3}\sqrt{x^2+16}$

(b) $\lim_{x\to 0}\dfrac{x^2+3x}{x}$

(c) $\lim_{x\to 2}\dfrac{3x^2-x-10}{x^2-4}$

(d) $\lim_{x\to 6^-}\dfrac{|x-6|}{x-6}$

(e) $\lim_{x\to 0}\dfrac{\sqrt{x^2+9}-3}{x^2}$

(f) $\lim_{x\to\infty}\dfrac{x^3+2x^2+1}{5x^5+4x^4+7}$

12. (*0 points*) Evaluate the following limits for $f(x)$

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

(a) $\lim_{x\to 1^-} f(x)$

(b) $\lim_{x\to 1^+} f(x)$

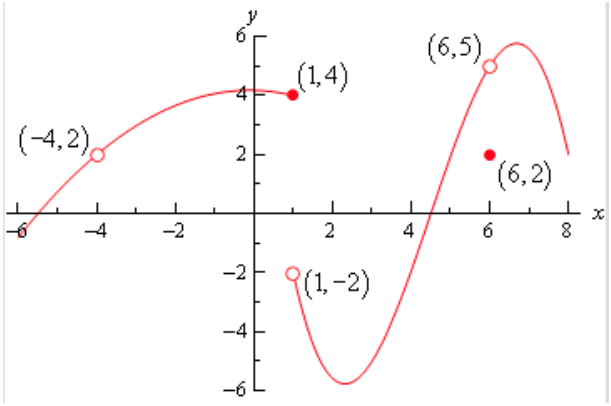
(c) $\lim_{x\to 1} f(x)$

(d) $\lim_{x\to 3^-} f(x)$

(e) $\lim_{x\to 3^+} f(x)$

(f) $\lim_{x\to 3} f(x)$

13. (*0 points*) Using the graph of $f(x)$ below, find the following limits:



(a) $\lim_{x\to 1^+} f(x)$

(b) $\lim_{x\to -4} f(x)$

(c) $\lim_{x\to 6} f(x)$