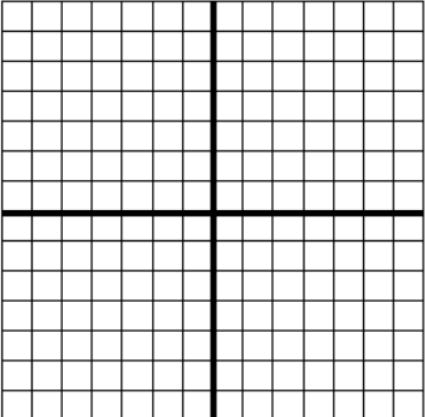
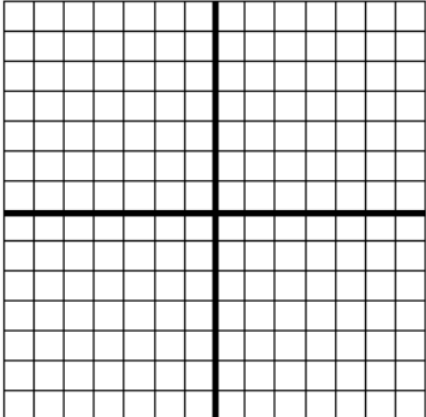


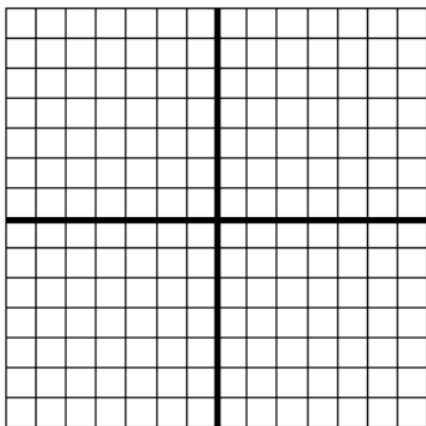
Directions: Welcome to your Calculus Class! This packet is meant to be a solid review of your prior knowledge to ensure a fruitful year ahead. There is no time limit attached to this assignment. You may, actually are encouraged to, use your notes from previous math classes to assist you in the completion of this packet. Be sure to come to class with any questions you may have on this work as I will have some time designated for that. Please show your work in the spaces provided for each problem.

1.	<p>a. Write an equation of a line in point-slope form that is parallel to $2y + 5x = 10$ and passes through the point $(-2,4)$</p> <p>b. Write an equation of a line in point-slope form that is perpendicular to $2y + 5x = 10$ and passes through the point $(5, -3)$</p>		
2.	<p>Simplify the following:</p> <p>a. $\frac{4m^4n^3p^3}{3m^2n^2p^4}$</p>	<p>b. $\frac{2h^3j^{-3}k^4}{3jk}$</p>	<p>c. $\frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0}$</p>
3.	<p>Simplify or solve the following:</p> <p>a. $\frac{x^2-5x-14}{7-x}$</p> <p>b. $\frac{x^2-9}{27-x^3}$</p> <p>c. $\frac{\frac{1}{x} - \frac{1}{5}}{x-5}$</p>		
	<p>d. $e^{3\ln(2)}$</p>	<p>e. $36^{2x} = 216^{x-1}$</p>	<p>f. $\left(\frac{1}{6}\right)^{3x+6} * 216^{3x} = \frac{1}{216}$</p>

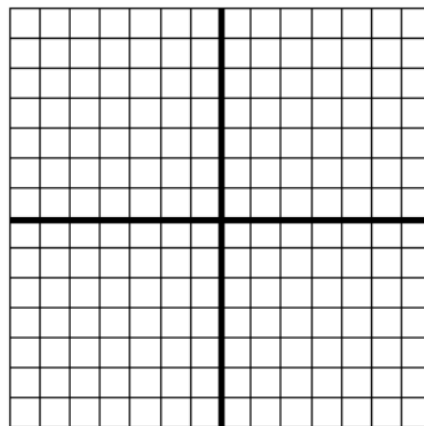
4.	Evaluate the following. Exact answers are expected as these are to be done without a calculator.	
	a. $\cos\left(\frac{5\pi}{3}\right)$	b. $\sin\left(\frac{3\pi}{4}\right)$
	c. $\sin\left(-\frac{7\pi}{6}\right)$	d. $\cos\left(\frac{15\pi}{4}\right)$
5.	Solve the following equations:	
	a. $x^3 - 6x^2 - 27x = 0$	b. $x^4 - 10x^2 - 35 = 0$
	c. $2 \cos(\theta) \sin(\theta) = \cos(\theta)$	d. $2 \sin^2(x) = -3 \sin(x) - 1$

6.	Consider the following functions and evaluate the following: $f(x) = 1 - x^2$ $g(x) = 2x + 1$	
	a. $f(g(1))$	b. $g(f(5))$
7.	Consider the following split function when evaluating the following: $f(x) = \begin{cases} x - 2 & x < 0 \\ x^2 + 1 & x \geq 0 \end{cases}$	
	a. $f(-4)$	b. $f(0)$
8.	Consider the following split function when evaluating the following: $h(x) = \begin{cases} \sqrt{x+1} & x \geq 0 \\ x^2 + 1 & x < 0 \end{cases}$	
	a. $h(5)$	b. $h(0)$
9.	Sketch the following functions on the graphs provided. Be mindful of how you scale your axes.	
	$f(x) = \sin(x)$ 	$f(x) = \cos(x)$ 

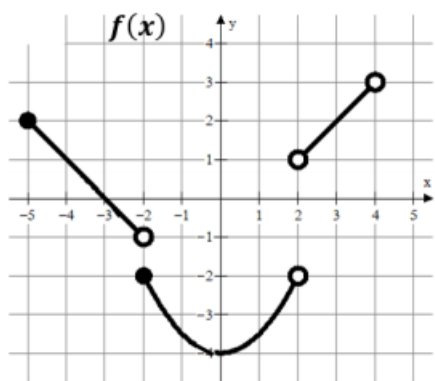
$$f(x) = \ln(x)$$



$$f(x) = e^x$$



10. Consider the graph of $f(x)$ below when answering the following:

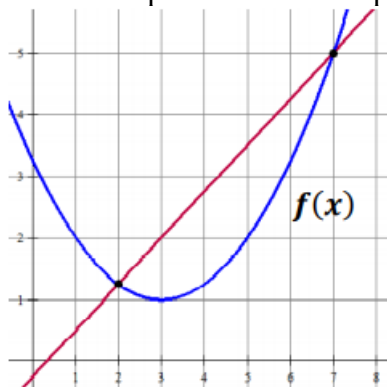


a. $\lim_{x \rightarrow -2^-} f(x) =$

b. $\lim_{x \rightarrow -2^+} f(x) =$

c. Determine whether $f(x)$ is continuous at the points:
 $x = -2$ $x = 0$ $x = 2$

11. Choose the expression which represents the average rate of change on the interval $[2, 7]$.



A) $\frac{7-2}{f(7)-f(2)}$

B) $\frac{f(7)-2}{7-f(2)}$

C) $\frac{7-f(2)}{f(7)-2}$

D) $\frac{f(7)-f(2)}{7-2}$

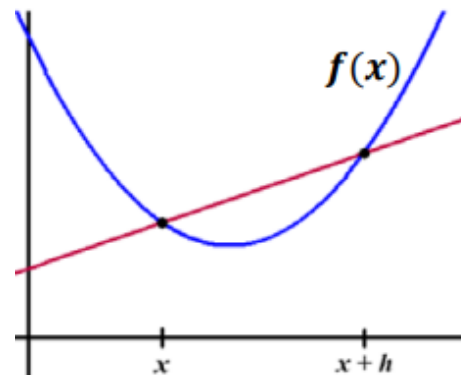
12. Choose the expression which represents the slope of the secant line shown below.

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

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

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

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



13.	Rewrite each of the following expressions using rational exponents.		
	a. $\sqrt[5]{x^3} + \sqrt[5]{2x}$	b. $\sqrt{x+1}$	c. $\frac{1}{\sqrt{x+1}}$
	d. $\frac{1}{\sqrt{x}} - \frac{2}{x}$	e. $\frac{1}{4x^3} + \frac{1}{2}\sqrt[4]{x^3}$	f. $\frac{1}{4\sqrt{x}} - 2\sqrt{x+1}$
14.	Which of the following functions has a vertical asymptote at $x = 4$?		
	<p>(A) $\frac{x+5}{x^2-4}$</p> <p>(B) $\frac{x^2-16}{x-4}$</p> <p>(C) $\frac{4x}{x+1}$</p> <p>(D) $\frac{x+6}{x^2-7x+12}$</p> <p>(E) None of the above</p>		
15.	Consider the function: $f(x) = \frac{x^2-5x+6}{x^2-4}$. Which of the following statements is true?		
	<p>I. $f(x)$ has a vertical asymptote of $x = 2$</p> <p>II. $f(x)$ has a vertical asymptote of $x = -2$</p> <p>III. $f(x)$ has a horizontal asymptote of $y = 1$</p> <p>(A) I only</p> <p>(B) II only</p> <p>(C) I and III only</p> <p>(D) II and III only</p> <p>(E) I, II and III</p>		
16.	Solve the following equations. Use the interval $[0, 2\pi]$ where appropriate.		
	a. $e^x + 1 = 2$	b. $e^x + xe^x = 0$	

	c. $3 - \ln(x) = 3$	d. $\cos(x) = \frac{\sqrt{3}}{2}$
	e. $2 \sin(x) = -1$	f. $\tan(x) = 0$
17.	Give the domain and range of each function shown below.	
	a. $y = \sqrt{x - 4}$	b. $y = (x - 3)^2$
	c. $y = \ln(x)$	d. $y = e^x$
18.	Evaluate the following limits	
	a. $\lim_{x \rightarrow 2} (x^3 - x^2 - 4)$	b. $\lim_{x \rightarrow 1} \frac{x-4}{x^2-6x+8}$
	c. $\lim_{x \rightarrow \infty} \frac{\sin(x)}{x}$	d. $\lim_{x \rightarrow 0} \frac{\sin(4x)}{x}$
	e. $\lim_{x \rightarrow \infty} \cos\left(\frac{3\pi}{x}\right)$	f. $\lim_{x \rightarrow 7} \frac{\sqrt{x+2}+3}{x-7}$

19. Consider the piecewise function defined below

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

a. Evaluate the following

$f(0)$

$f(3)$

$f(5)$

b. Determine $\lim_{x \rightarrow 4} f(x)$. Show the analysis that leads to your answer.

c. Determine the value of k so that $f(x)$ is defined and continuous at $x = 4$.

20. Solve the following inequalities using an interval line analysis.

a. $(2x + 1)(x - 1) \geq 0$

b. $(x + 3)^2(x - 2) < 0$

c. $e^x(x - 2)^2(x + 8) > 0$