To Whom It May Concern:

       You have registered to take AP Calculus AB for this school year. Going into AP Calculus, there are certain prerequisite math skills required for the course. We will spend very little time reviewing topics covered in prior classes. The expectations for this class are high and students are expected to be capable of independent study. The main objective of this course is to not only prepare you for the AP exam, but to prepare you for future college math courses. The following problems in this packet will help review topics and skills needed for this course. You may use your old notes or "Google" any areas of study they do not remember. You are responsible for completing this summer assignment. Complete work must be shown to justify your answers. Completion of the packet will count towards your first quarter grade.

This packet will be due during *the first week of classes.*

Hope you enjoy the rest of your summer.

Mr. Lee

Name_____   Calculus - Mr. Lee

Date_____   Review Assignment

SHOW ALL WORK

<u>**I. Simplify**</u>

1. $\dfrac{5-x}{x^2-25}$ 2. $\dfrac{x^3-8}{x-2}$

3. $\dfrac{2x^2+5x-12}{x^2-16}$ 4. $\dfrac{3x^2+10x+8}{6x^2+17x+10}$
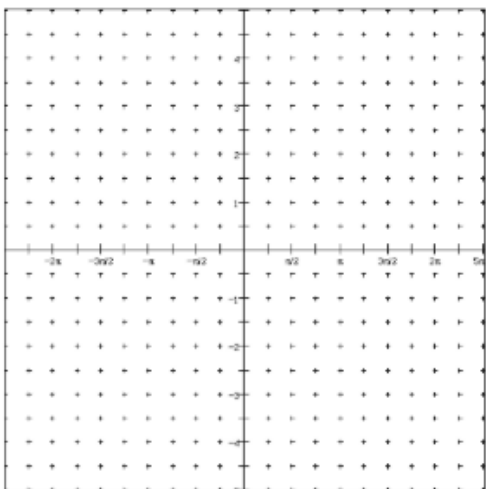
5. $\dfrac{1}{x+h}-\dfrac{1}{x}$ 6. $\dfrac{\dfrac{1}{3+x}-\dfrac{1}{3}}{x}$

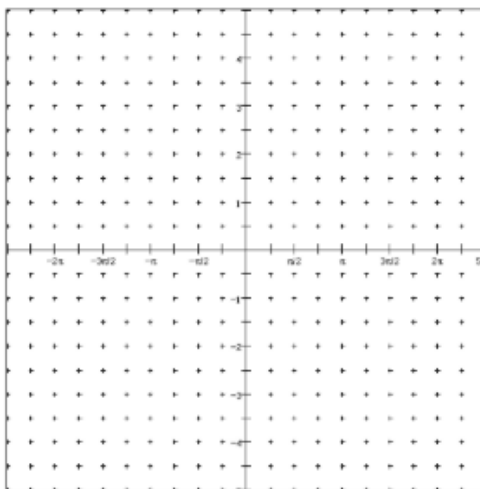## II. Sketch each graph and state its domain and range.

1. $y = \sin x$

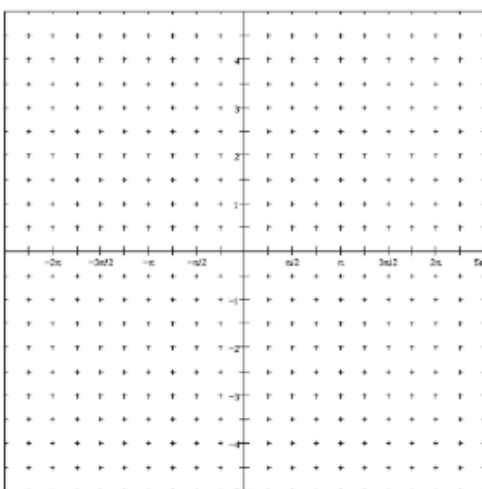Domain: _____

Range: _____

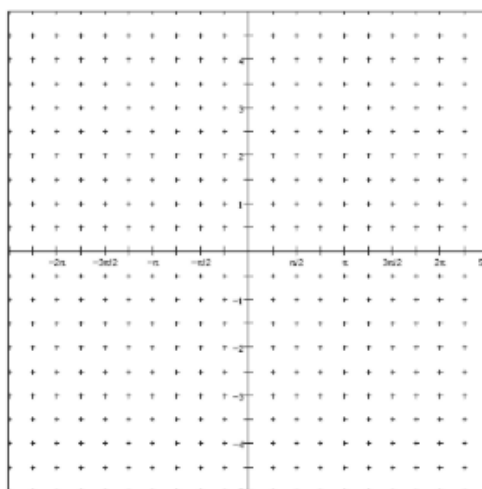2. $y = \csc x$

Domain: _____

Range: _____

3. $y = \cos x$

Domain: _____

Range: _____

4. $y = \sec x$

Domain: _____
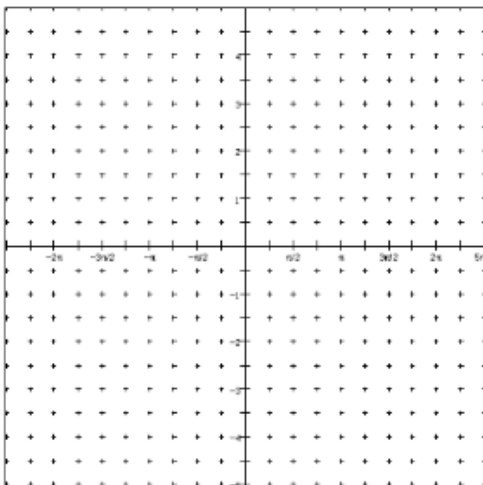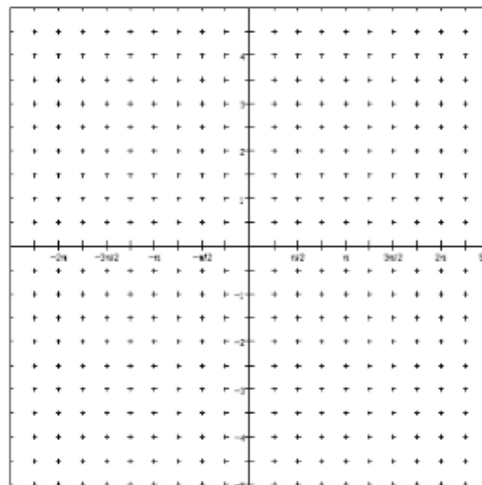
Range: _____

5. $y = \tan x$

Domain: _____

Range: _____

6. $y = \cot x$

Domain: _____

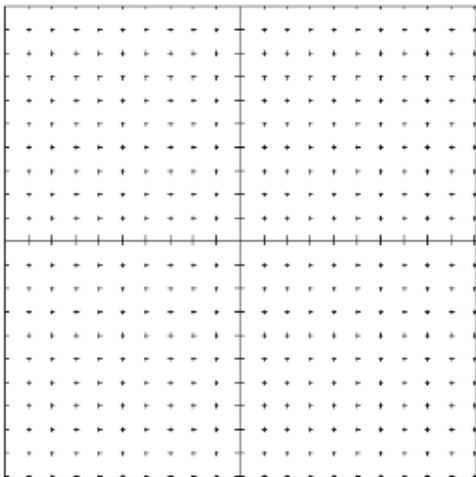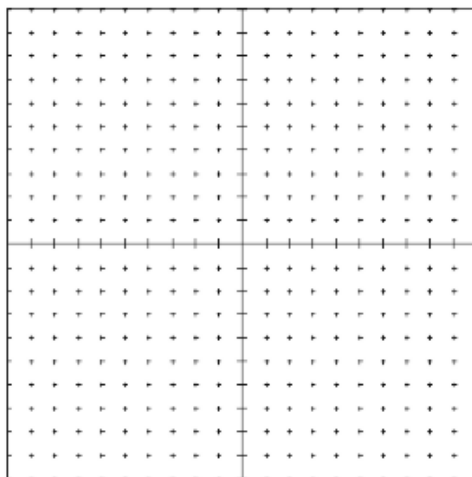Range: _____

7. $y = \sqrt{x}$

Domain: _____

Range: _____

8. $y = |x + 3| - 2$

Domain: _____
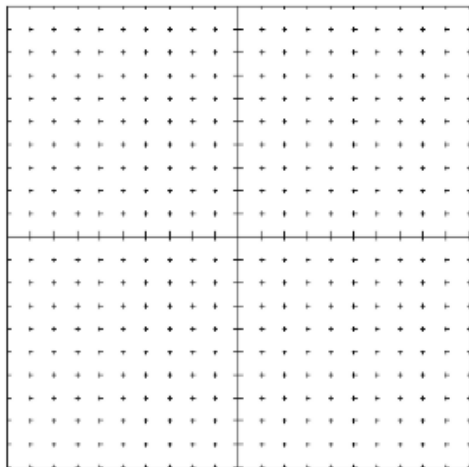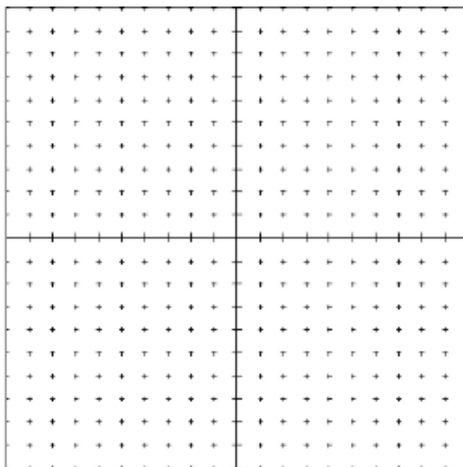
Range: _____

9. $y = \ln x$

Domain: _____

Range: _____
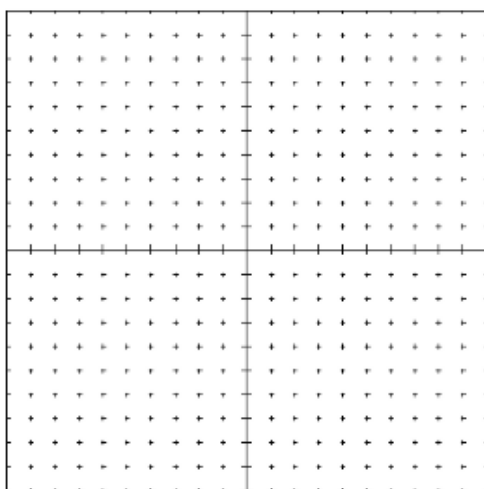
10. $y = e^x$

Domain: _____
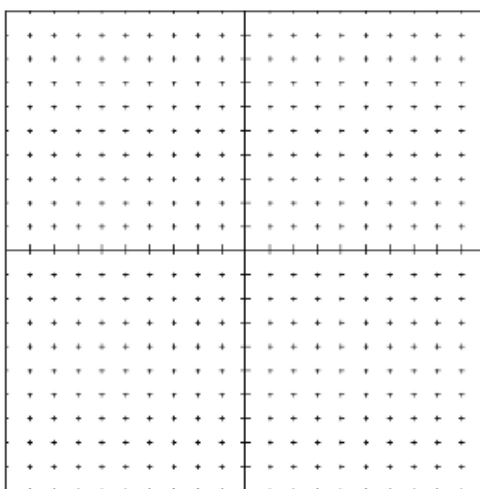
Range: _____

11. $y = \dfrac{1}{x}$

Domain: _____

Range: _____

12. $y = \begin{cases} x^2 & x < 0 \\ x+2 & 0 \le x \le 3 \\ 4 & x > 3 \end{cases}$

Domain: _____

Range: _____

III. Fill in the blanks:

Degrees	0	30	45	60	90	180	270	360
Radians	0	$\frac{\pi}{6}$						
Sine	0	$\frac{1}{2}$						
Cosine								
Tangent								

What are the Pythagorean Identities?

What are the Reciprocal and Quotient Identities?

$\csc x = \dfrac{1}{\rule{1cm}{0.4pt}}$	$\sec x = \dfrac{1}{\rule{1cm}{0.4pt}}$	$\cot x = \dfrac{1}{\rule{1cm}{0.4pt}}$	$\tan x = \rule{1cm}{0.4pt}$	$\cot x = \rule{1cm}{0.4pt}$

IV. Lines (SHOW ALL WORK)

1. Write the equation of the line that is parallel to the line with equation $4x + 3y = 9$ and that passes through the point $(0, 7)$

2. Write the equation of the line that is perpendicular to the line with equation $2x - y = 8$ and that passes through the point $(4,5)$

3. Write the equation of the line that is parallel to the x-axis and passes through the point $(-1,4)$

V. Simplify (SHOW ALL WORK)

1. $x^{3/2}\left(x + x^{5/2} - x^2\right)$

2. $\dfrac{3x^{4/3} - x + x^2}{x^{2/3}}$

3. $\log x + \log y + \log z - \log a$

4. $6\log m - 2\log n$

VI. Divide Using Long Division or Synthetic Division (SHOW ALL WORK)

1. $\dfrac{x^3 + 5x^2 + 5x - 2}{x + 2}$

2. $\dfrac{2x^4 - 15x^2 - 10x + 5}{x - 3}$

VII. Solve for x. (SHOW ALL WORK)

1. $\begin{cases} y = x^2 + 3x - 4 \\ y = 5x + 11 \end{cases}$

2. $\begin{cases} y = \sin x \\ y = \cos x \end{cases}$ (in Quadrant I)

3. $9^{x+1} = 27^x$
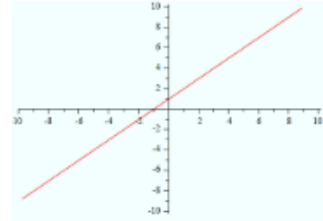
4. $\log x - \dfrac{1}{3}\log 8 = \log 7$
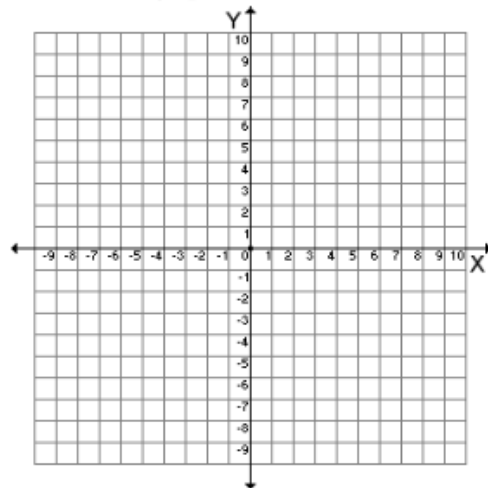
5. $20e^{2x} = 17$ (to the nearest thousandths)

VIII. Misc. (SHOW ALL WORK)

1. Mr. Squarepants graphs $\dfrac{x^2-1}{x-1}$ using his graphing calculator and sees following below:

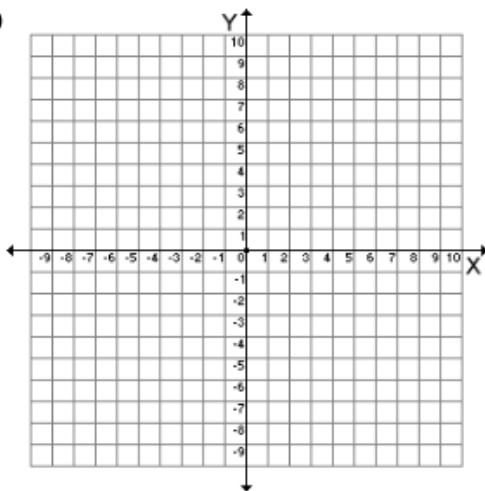Explain what is wrong with the graph and what you would change to correct it.

2. Sketch the graph of $y = x^2 + 2$. Find the inverse of this function and then graph the inverse on the same graph.

3. Sketch the graph of a) $f(|x|)$, b) $|f(x)|$, c) $f(2x)$ and d) $2f(x)$

$f(x) = 2x + 3$

a)&b)

c)&d)