This Worksheet will be collected at the end of your recitation section on **Thursday, Sep 1st**.

Precalculus Review

The following problems are meant to help you review some of the prerequisite material for this course. You may want to use Chapter 1 of our text as a resource.

1. True or False: The function $f(x) = x^4 - 5x^2 + 4$ is one-to-one on the domain $(1, \infty)$.

2. True or False: The function $f(x) = 2^x + 2^{-x}$ is invertible on its domain.

3. Find a formula for the inverse of the function below on the restricted domain $(-\infty, 1]$.
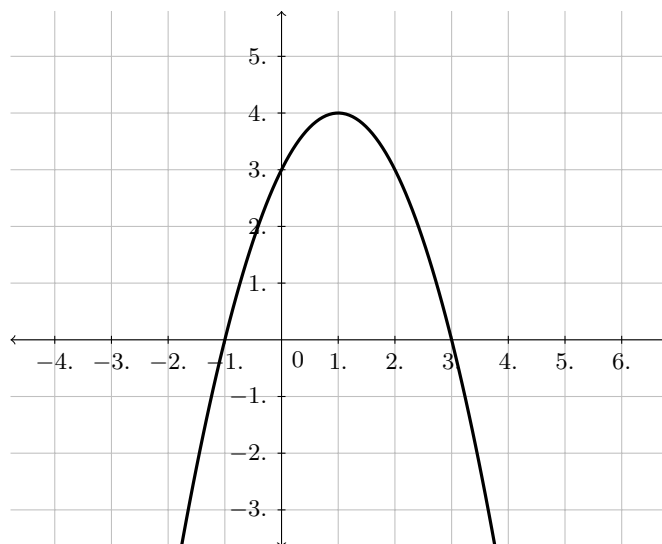
4. Solve the following equations. Leave your answers in exact form.

a) $e^{2x} - 5e^x = -6$

b) $2^{x^2+2x+1} = 3$

c) $\ln(t) - \ln(t+1) = 2$

5. Without using a calculator, find the exact value of the following

a) $\sin^{-1}\left(\sin\left(\frac{13\pi}{6}\right)\right)$

b) $\cos\left(\sin^{-1}\left(\frac{1}{2}\right)\right)$

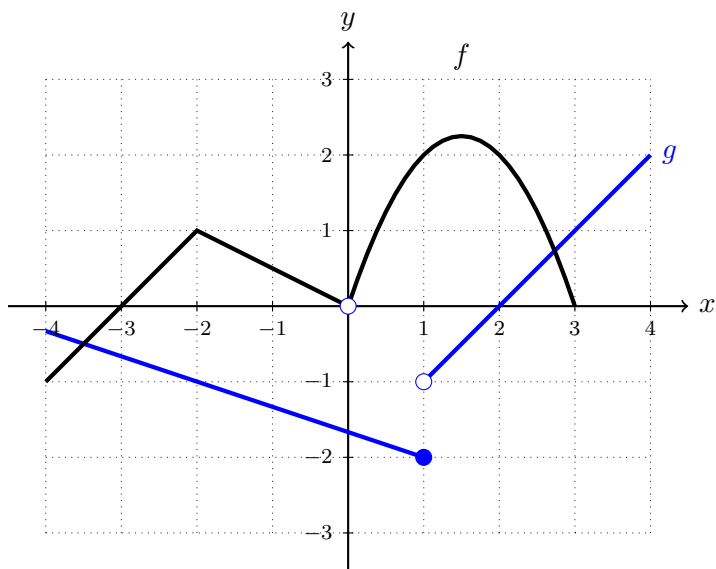c) $\cos\left(\tan^{-1}\left(\frac{4}{3}\right)\right)$

Sections 2.2 & 2.3: Limits of Functions and Limit Laws

6. Using a table and Desmos, explain why the following limit does not exist

$$\lim_{x \to 0} \sin\left(\frac{1}{x}\right).$$

7. Use the graphs of f and g below to evaluate the following limits (if possible).

$$\lim_{x \to -2} (f(x) + 5g(x))$$

$$\lim_{x \to 1^+} [f(x)g(x)]$$

$$\lim_{x \to 1^-} [f(x)g(x)]$$

$$\lim_{x \to 0} \frac{f(x)}{g(x)}$$

8. Find the following limits or state that they do not exist.

a) $\lim\limits_{x \to 2^+} \ln(x - 2)$

b) $\lim\limits_{x \to 1} \dfrac{x}{x - 1}$

c) $\lim\limits_{x \to \pi/2} \tan(x)$

d) $\lim\limits_{x \to \infty} \dfrac{x^2 + 3}{2x^2 + 2x + 4}$ (hint: divide in the numerator and denominator by x^2)

e) $\lim\limits_{x \to \infty} \dfrac{\cos(x)}{x^2}$ (hint: use squeeze theorem)

9. Use the indicated hints to find the following limits.

a) $\lim\limits_{x \to 2} \dfrac{2x^2 - 3x - 2}{x^2 - 4}$ (hint: factor and cancel)

b) $\lim\limits_{x \to 1} \dfrac{x - 1}{\sqrt{x + 3} - 2}$ (hint: multiply and divide by the conjugate of the denominator)

c) $\lim\limits_{x \to 10} \left(\dfrac{1}{x - 10} - \dfrac{20}{x^2 - 100} \right)$ (hint: rewrite as a single fraction)

Questionnaire:

Below are a few questions which are completely optional, and are meant to benefit you. Please only fill out what you feel comfortable with.

1. Is there anyone in class that you'd like to be grouped with next week?

2. Did you feel you worked well with your group this week?

3. Any other comments?

Grading Rubric:

Attendance: /20

Participation: /20

Completeness: /60