Problem Set 1 (Total Points: 100)

Please submit this homework on a separate sheet of paper. You don't need to copy the problems but you should write the number of each problem you're writing the answer to.

General Questions (0 points each)

1. What's your name? And how do you prefer to be called?
2. What's your email address?
3. Are you planning on taking AP Calculus AB or BC while you're in high school? Which one?

Review Questions (2 points each)

For these question you do not need to show work. If you show work you may get partial credit.

4. $f(2) = ?$ where $f(x) = \frac{2}{3}x + \frac{1}{2}$
5. Find the value of a that satisfies the equation $3^{2a} = 81$.
6. $\sin(\pi/4) = ?$
7. $\tan(\pi/2) = ?$
8. Solve the equation for $x : 4x + 7 = 3x - 2$
9. Simplify the expression: $3x + 2x^2 + x^2 - (x + 1) + x$
10. Simplify the expression: $(x + 1)^2 - (1 - x)^2$
11. Simplify the expression: $\sin^2(x) + \cos^2(x)$
12. What's the slope of the line $y = 3x - 2$?
13. Solve the system of equations:

$$2x + 4y = 16$$
$$3x - 2y = 0$$

14. What's the area of a rectangle whose sides are 3 meters and 4 meters long?
15. Determine the equation of a line passing through the points $(2, 0)$ and $(0, 5)$.

Graphing

Problem (16)**.** 26 points: You shouldn't use a graphing calculator for this problem. A scientific calculator might be helpful though. Match the following graphs an equations.

(a) $a(x) = -|x^2 - 4|$

(b) $b(x) = (\frac{x}{2})^3 + x - 4$

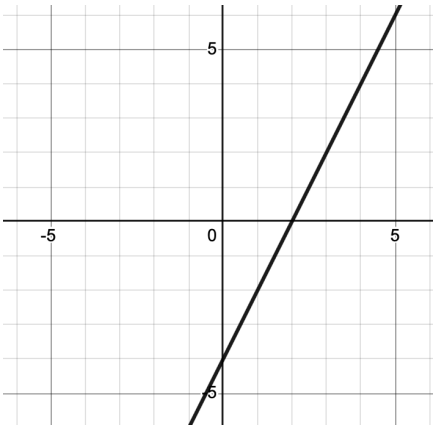
(c) $c(x) = (\frac{x}{4})^4 - 4$

(d) $d(x) = 2x - 4$

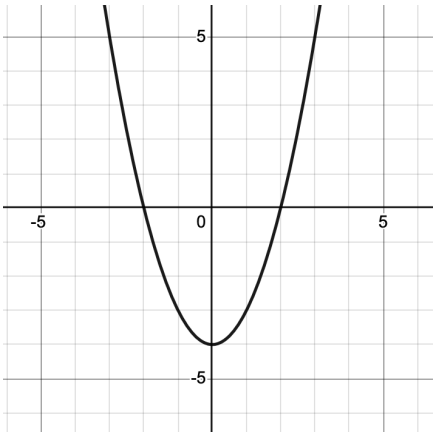
(e) $e(x) = 4 \cdot 2^x - 4$

(f) $f(x) = x^2 - 4$

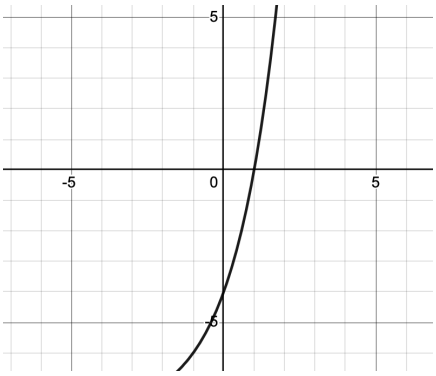
(i)



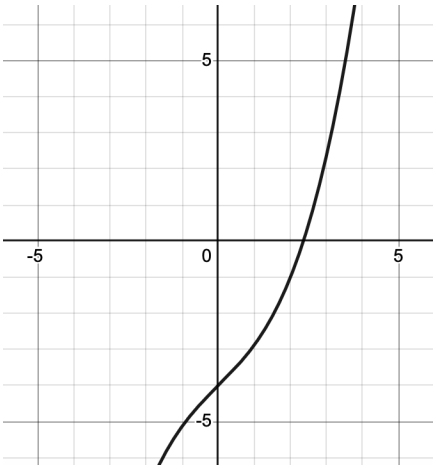
(ii)



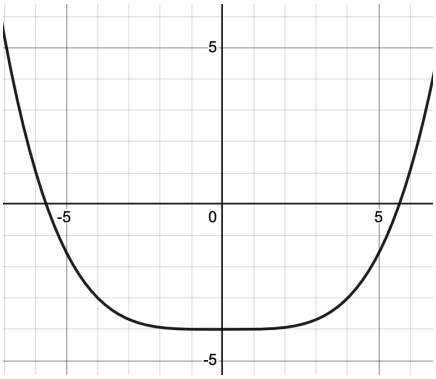
(iii)

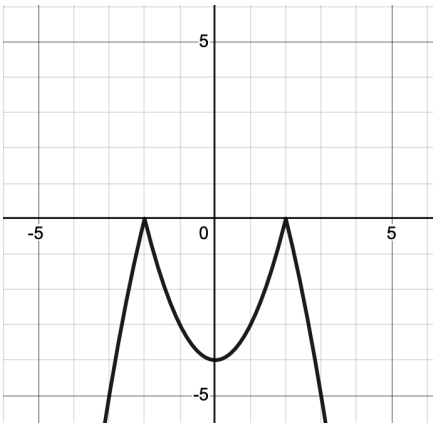


(iv)



(v)



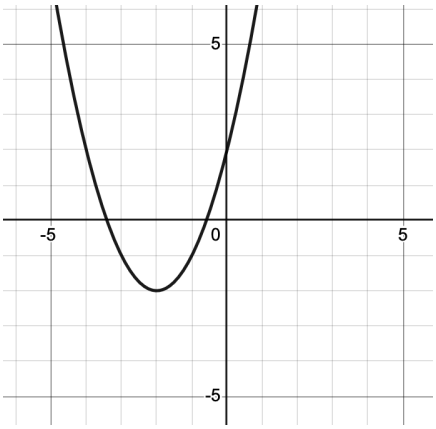
(vi) 

Problem (17)**.** 50 points: You shouldn't use a graphing calculator for this problem. A scientific calculator might be helpful though. Sketch graphs of the following functions:

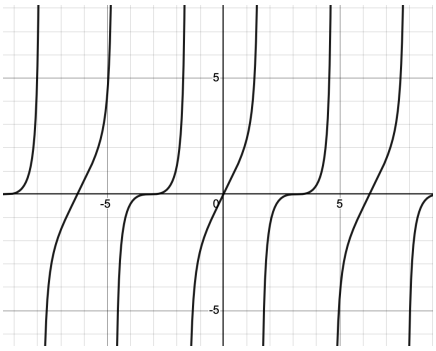
- $f(x) = x^2 + 2x + 1$
- $f(x) = -x^3$
- $f(x) = \dfrac{|x| + x}{2}$
- $f(x) = \dfrac{1}{x^2}$
- $f(x) = \sin(2x) + 1$

Problem (Bonus)**.** 30 points: You may use a graphing calculator on this question (in general you are always allowed to use a graphing calculator per the syllabus). Find functions whose graphs are the following:

(a)



(b)



(c)