

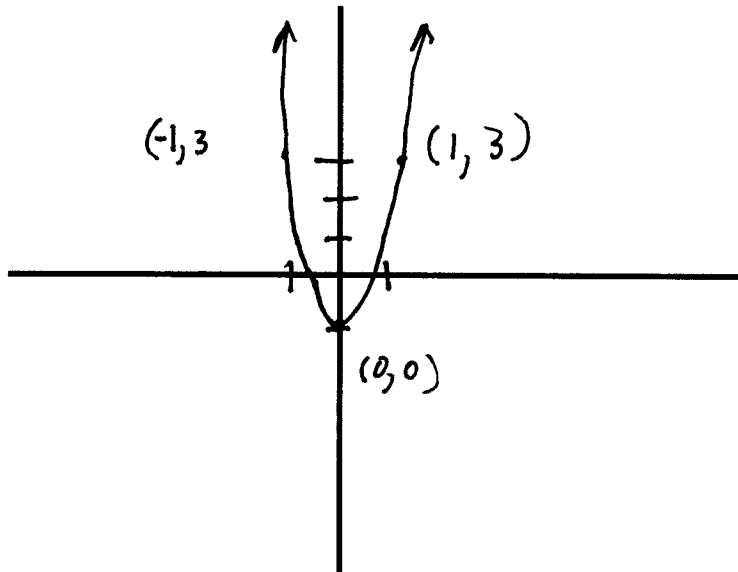
Problem 1 (15 Points). For the following problem  $f(x) = 4x^2 - 1$

(3 pts) a) Find the domain of  $f(x)$ .

$f(x)$  is a polynomial.

Domain: All Real numbers.

(6 pts) b) Graph  $f(x)$  and label at least 3 points on your graph.



(3 pts) c) On what interval(s) is  $f(x)$  positive?

$$4x^2 - 1 = 0 \quad \text{either } 2x - 1 = 0 \text{ or } 2x + 1 = 0$$

$$(2x - 1)(2x + 1) = 0$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$2x = -1$$

$$x = -\frac{1}{2}$$

$f(x)$  is positive on  $(-\infty, -\frac{1}{2}) \cup (\frac{1}{2}, \infty)$

(3 pts) d) What interval(s) is  $f(x)$  negative?

$$\left(-\frac{1}{2}, \frac{1}{2}\right)$$