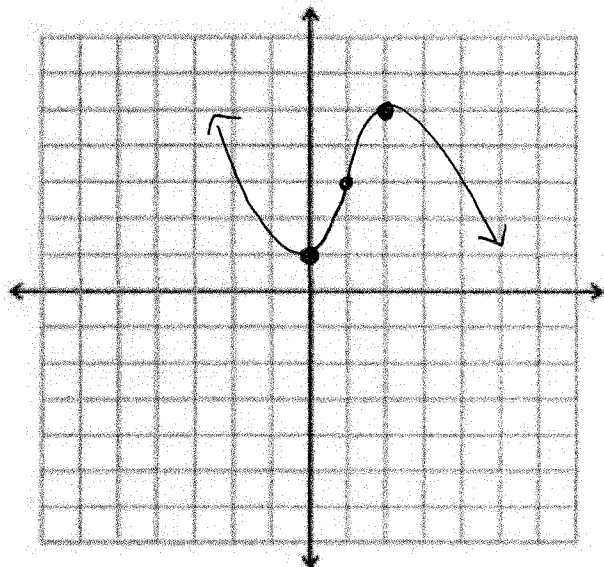


On the blank graph below, draw the graph of the following function:

$$f(x) = -x^3 + 3x^2 + 1$$

To help draw your graph, find all asymptotes, relative maxima and minima, where $f(x)$ is increasing/decreasing, all inflection points, and where $f(x)$ is concave up and concave down.

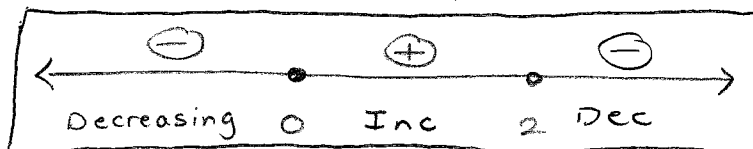


$$f'(x) = -3x^2 + 6x$$

$$f''(x) = -6x + 6$$

$$0 = -3x^2 + 6x = 3x(-x + 2)$$

$$x = 0 \quad x = 2$$



$$f'(-1) = -3(-1)^2 + 6(-1) = -3 - 6 = -9$$

$$f'(1) = -3 + 6 = 3$$

$$f'(3) = -3 \cdot 9 + 6 \cdot 3 = -9$$

$$f(0) = 1$$

Relative Min at (0, 1)

$$f(2) = -8 + 12 + 1 = 5$$

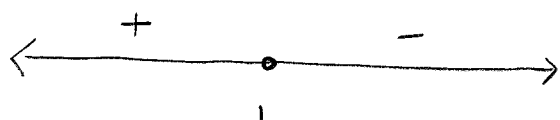
Relative Max at (2, 5)

$$f''(x) = 0 \text{ means}$$

$$0 = -6x + 6$$

$$6x = 6$$

$$x = 1$$



$$f''(0) = 6$$

$$f''(2) = -6$$

$$f(1) = -1 + 3 + 1 = 3$$

Inflection Pt: (1, 3)

Concave UP: $x < 1$

Concave Down: $x > 1$

Quiz 2 Rubric

1st Deriv	10
2nd Deriv	10
Rel Max	10
Rel Min	10
Inf Inf Point	10
Inc / Dec	10 10
Concave Up/Down	10
<hr/>	
Graph	
↳ Correct Crit Points	10
↳ Inc / Dec in correct places	10
↳ Concave Up/Down	10