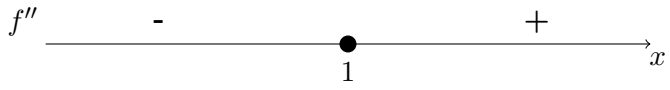
Quiz

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (5 points) Find the intervals on which $f(x) = 2x^3 - 6x^2 - 3x + 8$ is concave up and the intervals on which $f(x)$ is concave down.

Solution: To find the interval on which $f(x)$ is concave up and concave down. We need to check the sign of the second derivative. Note that: $f''(x) = 12x - 12 = 12(x-1) = 0$ when $x = 1$.

$$\text{if } x < 1 : f''(-1) = 12(-1-1) = -24 < 0,$$
$$\text{if } x > 1 : f''(3) = 12(3-1) = 24 > 0.$$



So $f(x)$ is concave up on the interval $(1, +\infty)$, and $f(x)$ is concave down on the interval $(-\infty, 1)$.

2. (5 points) Using the constraint equation $4x + 2y = 100$, write the product $A = xy$ as an equation in terms of x only.

Solution: Using the constraint we find that $y = 50 - 2x$. Substituting into our main equation, we find the product $A(x) = x(50 - 2x) = 50x - 2x^2$.

Name: _____

Section (circle one): 021 022 023 024

Question:	1	2	Total
Points:	5	5	10
Score:			