Quiz 4

Name: SOLUTIONS

1. Let $p(x) = 2x^3 - 12x^2 + 18x - 1$.

a. Compute $p'(x)$ and $p''(x)$.

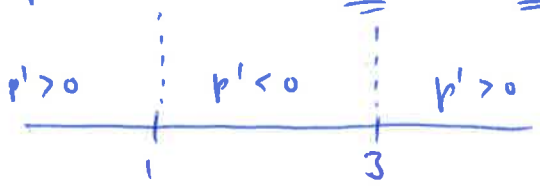
$p'(x) = 6x^2 - 24x + 18$

$p''(x) = 12x - 24$

b. Where is $p(x)$ increasing? decreasing?

Note that $p'(x) = 6(x^2 - 4x + 3) = 6(x-1)(x-3)$; thus,

$p'(x) = 0$ when $x = 1$ or $x = 3$.



$\Rightarrow$ p is increasing when $x < 1$ and when $x > 3$.

p is decreasing when $1 < x < 3$.

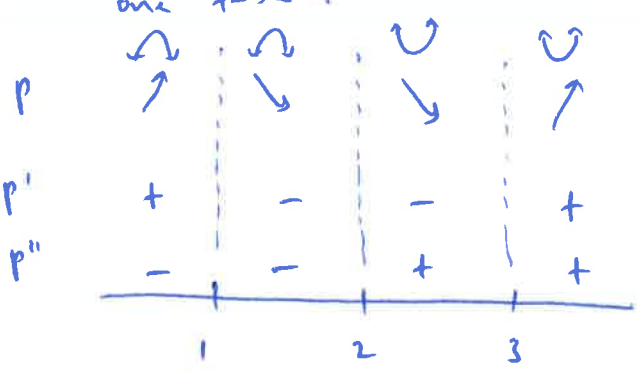
c. Where is $p(x)$ concave up? concave down?

$p''(x) = 12(x-2)$, so $p'' > 0$ when $x > 2$ and $p'' < 0$ when $x < 2$.

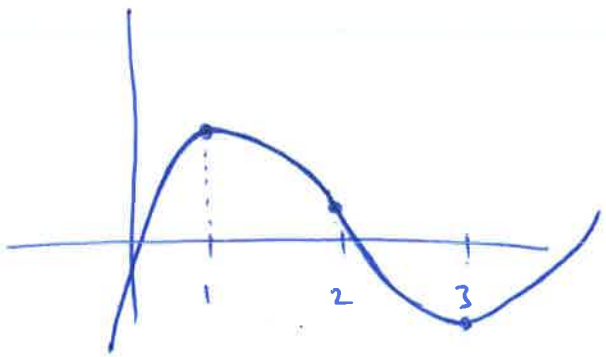
p concave up. p concave down

d. Plot $p(x)$.

Information from (b) and (c) in one table:



use this table to sketch $p(x)$:



2. Use the following graph of $y = f(x)$ to plot $f'(x)$ and $f''(x)$.