Quiz 5 take home — Marcay M.

① $f(x) = (x+3)e^{2x}$

$f'(x) = (x+3)(e^{2x}) + (x+3)(e^{2x})$

$f'(x) = (1)(e^{2x}) + (x+3)(e^{2x})(2x)$

$f'(x) = e^{2x} + (2x+6)(e^{2x})$

$f'(x) = e^{2x} + 2e^{2x}x + 6e^{2x}$

$f(x) = 2e^{2x}x + 7e^{2x}$

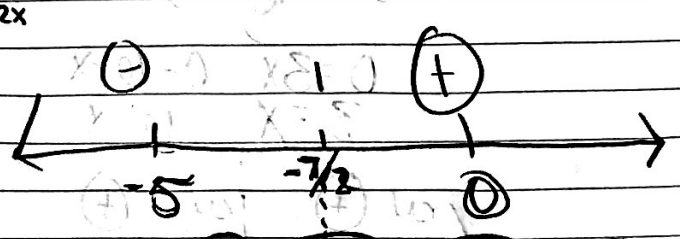
$0 = 2e^{2x}x + 7e^{2x}$

$0 = e^{2x}(2x+7)$

$0 \neq e^{2x}$

$0 = 2x+7$

$\frac{-7}{2} = x$




local minimum: $x = -7/2$

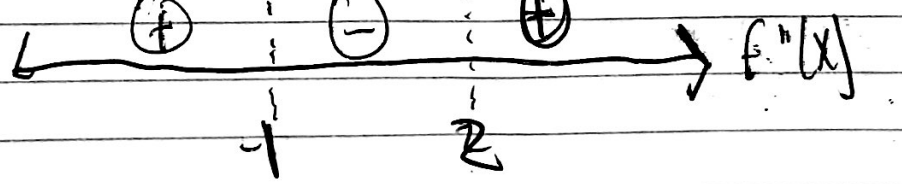
② dec on $(-\infty,6) + (6,\infty)$ × concave ↓ = $(-\infty,3) + (6,\infty)$

inc on $(-\infty,-6)$ | concave ↑ = $(-3,6)$

decreasing + concave ↓

↳ $= (6,\infty)$ ✓

③ a)




b) ii

Quiz 5 continued

4. $R(x) = 3x^3 - .25x^4 + 200 \quad 0 \leq x \leq 9$

$R'(x) = 9x^2 - x^3$

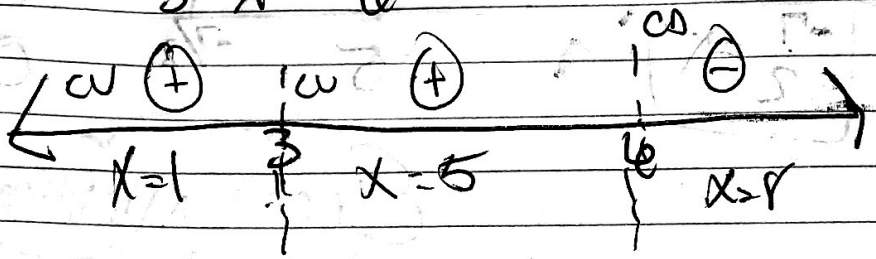
$R''(x) = 18x - 3x^2$

$0 = 18x - 3x^2$

$0 = 3x(6 - x)$

$0 = 3x \quad 0 = 6 - x$

$3 = x \quad 6 = x$




Sol: P.D.R $x = 6$

After spending $6000 the current revenue will increase but will only do so at the decreasing rate