HW 4.2 p. 202 15, 16, 21, 26, 28

Friday, November 7, 2014
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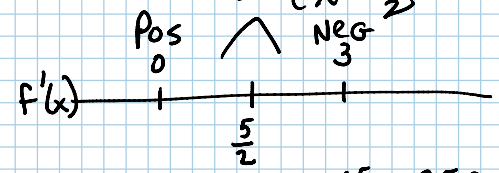
(15) $f(x) = 5x - x^2$

$f'(x) = 5 - 2x = 0$

zero $x = \frac{5}{2}$ Never DNE



(a) Local Max at $\left(\frac{5}{2}, \frac{25}{4}\right)$
No Min

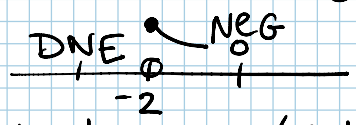
(b) Increasing $(-\infty, \frac{5}{2}]$ bc $f'(x) > 0$ on $(-\infty, \frac{5}{2})$

(c) Decreasing $[\frac{5}{2}, \infty)$ bc $f'(x) < 0$ on $(\frac{5}{2}, \infty)$

(21) $y = 4 - \sqrt{x+2} = 4 - (x+2)^{\frac{1}{2}}$ Dom $[-2, \infty)$

$y' = -\frac{1}{2}(x+2)^{-\frac{1}{2}} \cdot 1$

$= \frac{-1}{2\sqrt{x+2}}$ Never $= 0$
DNE @ $x = -2$



(a) Local Max at $(-2, 4)$

(b) ϕ

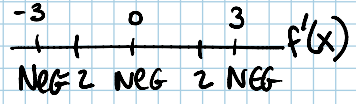
(c) Decreasing $[-2, \infty)$ bc $y' < 0$ on $(-2, \infty)$

(26) $k(x) = \frac{x}{x^2 - 4}$

$k'(x) = \frac{(x^2-4)1 - x(2x)}{(x^2-4)^2}$

$= \frac{x^2 - 4 - 2x^2}{(x^2-4)^2} = \frac{-x^2 - 4}{(x^2-4)^2}$

$f'(x)$ Never $= 0$
DNE @ $x = 2, -2$



(a) No Min/MAX

(b) ϕ

(c) Decreasing $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$
bc $f'(x) < 0$ on those intervals

(28) $g(x) = 2x + \cos x$

$g'(x) = 2 - \sin x$

$2 - \sin x = 0$

$\sin x = 2$ Never

$f'(x)$ is never 0 and never DNE

So

(a) No Local Min/Max

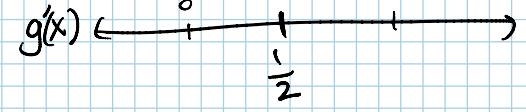
(b) $g'(x) > 0$ for all x
So Increasing $(-\infty, \infty)$ bc $f'(x) > 0$

(c) ϕ

(16) $g(x) = x^2 - x - 12$

$g'(x) = 2x - 1 = 0$

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



(a) local min @ $x = \frac{1}{2}$

(b) Increasing $[\frac{1}{2}, \infty)$ bc $g'(x) > 0$ on $(\frac{1}{2}, \infty)$

(c) Decreasing $(-\infty, \frac{1}{2}]$ bc $g'(x) < 0$ on $(-\infty, \frac{1}{2})$