MTH 140 - Quiz 8

$$f(x) = 2x^2 - 5x + 2$$

find critical points:

$$f'(x) = \boxed{4x - 5 \overset{\text{set}}{=} 0}$$

$\downarrow$ solve

$\boxed{x = \frac{5}{4}}$ one critical point

f'

$\ominus$ $\oplus$

X $|$ X

0    $\frac{5}{4} = 1.25$ 2

test points
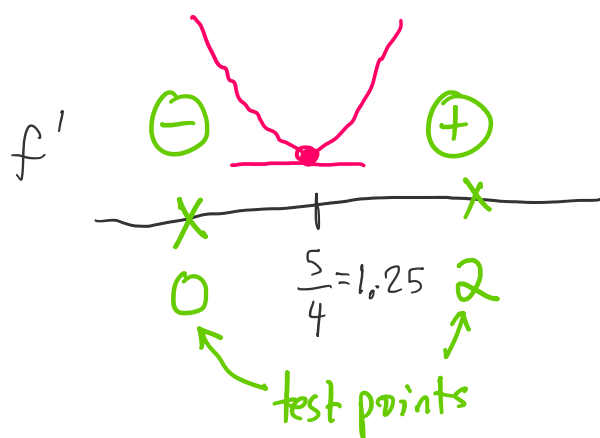
plug critical points into f':

$$f'(0) = 4(0) - 5 = -5 < 0 \; \ominus$$

$$f'(2) = 4(2) - 5 = 3 > 0 \; \oplus$$

$\Rightarrow$ Value of f at critical point:

$$f\left(\frac{5}{4}\right) = 2\left(\frac{5}{4}\right)^2 - 5\left(\frac{5}{4}\right) + 2$$

$$= \frac{50}{16} - \frac{25}{4} + \frac{8}{4}$$

$$= \frac{25}{8} - \frac{50}{8} + \frac{16}{8}$$

$$= \frac{-25}{8} + \frac{16}{8} = \frac{-9}{8}$$

$\Rightarrow$ Local minimum of $-\frac{9}{8}$ occurs at $x = \frac{5}{4}$.

$2x^2 - 5x + 2$

$(1.25, -1.125)$