10.

$f(x) = \frac{1}{3}x^3 - \frac{7}{2}x^2 + 10x + 2$

$f'(x) = \frac{1}{3}\cdot 3x^2 - \frac{7}{2}\cdot 2x^1 + 10$

- $f'(x) = x^2 - 7x + 10$

$x^2 - 7x + 10 = 0$

(PSD) $(x-2)(x-5) = 0$

$x-2=0 \quad x-5=0$

$x=2 \quad x=5$ ← C's

$f''(x) = 2x - 7$

$x=2$ $\qquad$ $x=5$

$f''(2) = 2(2) - 7$ $\qquad$ $f''(5) = 2(5) - 7$

$= -3$ $\qquad$ $= 3$

< 0 $\qquad$ > 0

REL MAX AT $x=2$ $\qquad$ REL MIN AT $x=5$

$y = \frac{1}{3}(2)^3 - \frac{7}{2}(2)^2 + 10(2) + 2$

$= \frac{8}{3} - 14 + 20 + 2$

$= \frac{8}{3} + 8$

$= \frac{32}{3}$

REL MAX: $(2, \frac{32}{3})$

$y = \frac{1}{3}(5)^3 - \frac{7}{2}(5)^2 + 10(5) + 2$

$= \frac{125}{3} - \frac{175}{2} + 50 + 2$

$= \frac{37}{6}$

REL MIN $(5, \frac{37}{6})$

SECOND DERIVATIVE TEST

(1) FIND 1ST DERIVATIVE

(2) SET THIS EQUAL TO ZERO AND SOLVE "CRITICAL #'S"

(3) FIND 2ND DERIVATIVE

(4) PLUG IN CRITICAL #'S AND USE TABLE

(5) FIND y VALUES FROM ORIGINAL FUNCTION