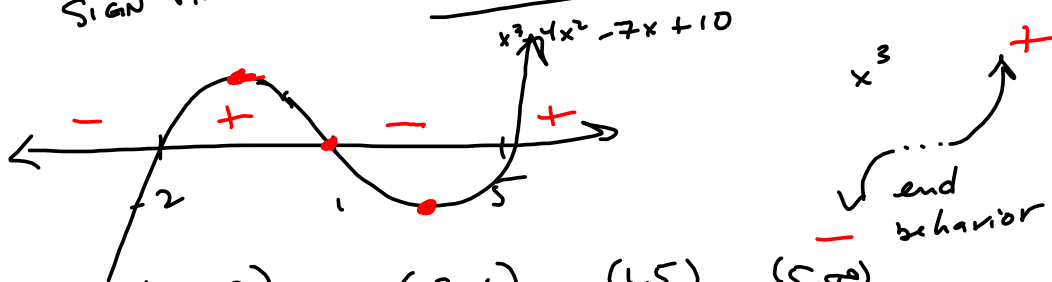


Check your e-mail. Your graded Midterm is there.

$$f(x) = (x-1)(x+2)(x-5) = (x-1)(x^2 - 3x - 10)$$

$$= \frac{x^3 - 3x^2 - 10x}{-x^2 + 3x + 10}$$

SIGN PATTERN



	$(-\infty, -2)$	$(-2, 1)$	$(1, 5)$	$(5, \infty)$
$x-1$	-	-	+	+
$x+2$	-	+	+	+
$x-5$	-	-	-	+
$f(x)$	-	+	-	+

Test values!

$(-\infty, -2)$	-3
$(-2, 1)$	0
$(1, 5)$	2
$(5, \infty)$	6

$$-4 \cdot -1 \cdot -8 = -32$$

$$(-3-1)(-3+2)(-3-5) = (-)(-)(-) = -$$

$$(0-1)(0+2)(0-5) = (-)(+)(-) = +$$

$$(2-1)(2+2)(2-5) = (+)(+)(-) = -$$

$$(6-1)(6+2)(6-5) = (+)(+)(+) = +$$

$$f(x) = x^3 - 4x^2 - 7x + 10 \rightarrow$$

$$f'(x) = 3x^2 - 8x - 7 \stackrel{!}{=} 0$$

$$a=3, b=-8, c=-7$$

$$b^2 - 4ac = 64 - 4(3)(-7) = 64 + 84 = 148$$

$$\sqrt{148} = 2\sqrt{37}$$

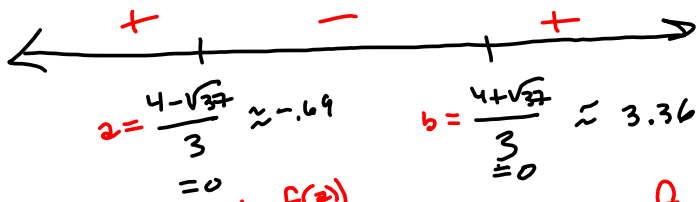
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{8 \pm 2\sqrt{37}}{2(3)} = \frac{4 \pm \sqrt{37}}{3}$$



$$\begin{array}{l} 2 \sqrt{148} \\ 2 \sqrt{74} \\ 37 \end{array}$$

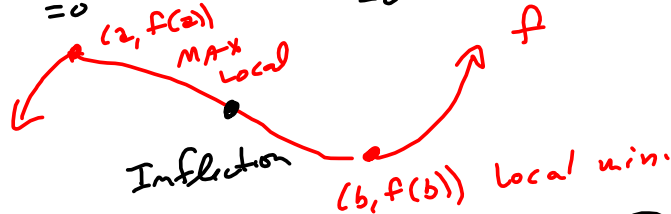
$$3.360920843 \approx b$$

$$-0.694254177 \approx a$$



$$f(a) \approx 12.59720101$$

$$f(b) \approx -20.74534914$$



Concavity changes from \cap to \cup
 $f'' < 0$ $f'' > 0$
 Concave down Concave up

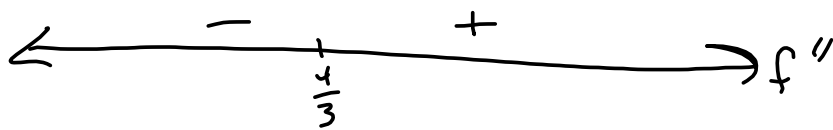


$$f'(x) = 3x^2 - 8x - 7 \rightarrow$$

$$f''(x) = 6x - 8 \stackrel{SGT}{=} 0 \rightarrow$$

$$6x = 8$$

$$x = \frac{8}{6} = \frac{4}{3}$$



$$f'(1/3) \approx -4.074074074$$

$A = (-2, 0)$
 $B = (1, 0)$
 $C = (5, 0)$

