

Check out your graded test.

So average will be taken out of 125 points.

120+5

108+5

97+5

88+5

85+5

42+5

12+5

The most obvious lost points is no one knows how to write a lexicon for a word problem. That's like 3 out of the 10 points.

$$x^2 - 16x + 46 = 0 =$$

$$= x^2 - 16x + 8^2 - 64 + 46$$

$$= (x-8)^2 - 18 = 0$$

$$\Rightarrow (x-8)^2 = 18$$

$$x-8 = \pm\sqrt{18}$$

$$x = 8 \pm 3\sqrt{2}$$

$$\begin{array}{r} 2 \overline{) 18} \\ \underline{16} \\ 2 \\ \underline{2} \\ 0 \end{array}$$

Quadratic Formula

$$x^2 - 16x + 46 = 0$$

$$a=1, b=-16, c=46$$

$$x = \frac{16 \pm \sqrt{(-16)^2 - 4(1)(46)}}{2(1)}$$

$$= \frac{16 \pm \sqrt{256 - 184}}{2} = \frac{16 \pm \sqrt{72}}{2} = \frac{16 \pm 6\sqrt{2}}{2} = 8 \pm 3\sqrt{2}$$

$$(-16)^2 = 16^2$$

2 wrongs don't make a right

BAD

Do 1st

$$b^2 - 4ac = 16^2 - 4(1)(46) = 256 - 184 = 72$$

$$\sqrt{72} = \dots = (\text{see above}) = 6\sqrt{2}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{16 \pm 6\sqrt{2}}{2} = \cancel{x} \frac{(8 \pm 3\sqrt{2})}{\cancel{x}} = 8 \pm 3\sqrt{2}$$

$$\begin{array}{r} 2 \overline{) 72} \\ \underline{40} \\ 32 \\ \underline{24} \\ 8 \\ \underline{6} \\ 2 \end{array}$$

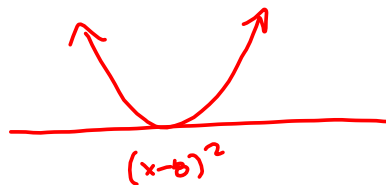
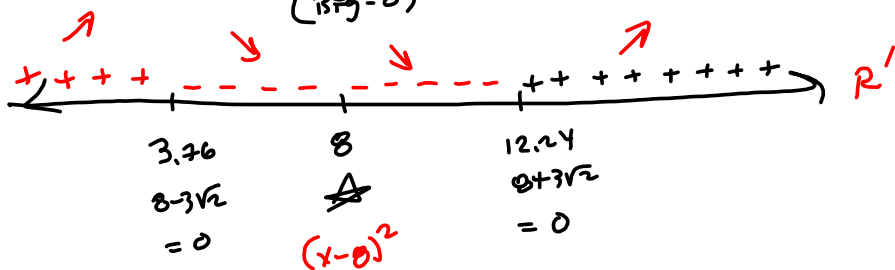
Sign Pattern for $R'(x)$

$$R'(x) = \frac{x^2 - 16x + 46}{(x-8)^2} = \frac{(x - (8+3\sqrt{2}))(x - (8-3\sqrt{2}))}{(x-8)^2}$$

End Behavior

x Big:

$$\frac{Big^2 - 16Big + 46}{(Big - 8)^2} = \frac{+}{+^2} = +$$



SIGN PATTERN

	TEST		$\frac{(x-3.76)(x-12.24)}{(x-8)^2}$
$(-\infty, 3.76)$	0	$\frac{(-3.76)(-12.24)}{(-8)^2}$	$\frac{(-)(-)}{+} = +$
$(3.76, 8)$	4	$\frac{(4-3.76)(4-12.24)}{(4-8)^2}$	$\frac{(+)(-)}{+} = -$
$(8, 12.24)$	9	$\frac{(9-3.76)(9-12.24)}{(9-8)^2}$	$\frac{(+)(-)}{+} = -$
$(12.24, \infty)$	13	$\frac{(13-3.76)(13-12.24)}{(13-8)^2}$	$\frac{(+)(+)}{(+)} = +$

$$R(x) = \frac{x^2 - 7x + 10}{x - 8} \Rightarrow R'(x) = \frac{(2x - 7)(x - 8) - (x^2 - 7x + 10)(1)}{(x - 8)^2}$$

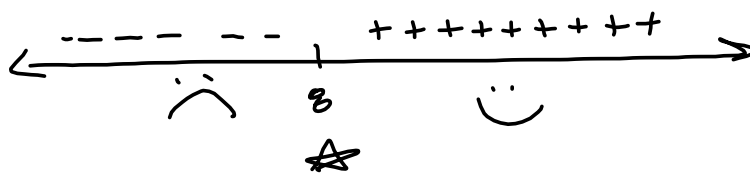
$$\frac{2x^2 - 7x - 16x + 56 - x^2 + 7x - 10}{(x - 8)^2} = \frac{x^2 - 16x + 46}{(x - 8)^2} = R'(x)$$

$$R''(x) = \frac{(2x - 16)(x - 8)^2 - (x^2 - 16x + 46)(2(x - 8)(1))}{(x - 8)^4}$$

$$= \frac{(x - 8) \left[(2x - 16)(x - 8) - 2(x^2 - 16x + 46) \right]}{(x - 8)^4}$$

$$= \frac{2x^2 - 32x + 128 - 2x^2 + 32x - 92}{(x - 8)^3}$$

$$= \frac{128 - 92}{(x - 8)^3} = \boxed{\frac{36}{(x - 8)^3} = R''(x)}$$



Slant Asymptote

$$\frac{x^2 - 7x - 10}{x - 8}$$

$$\begin{array}{r} 8 \overline{) 1 \quad -7 \quad 10} \\ \underline{ 8 } \\ 1 -7 10 \\ \underline{ 8 } \\ 1 -7 10 \\ \underline{ 8 } \\ 1 -7 10 \end{array}$$

$$y = x + 1$$

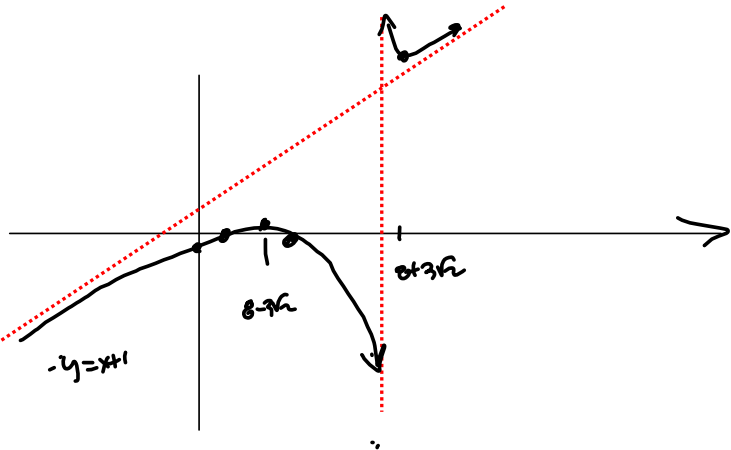
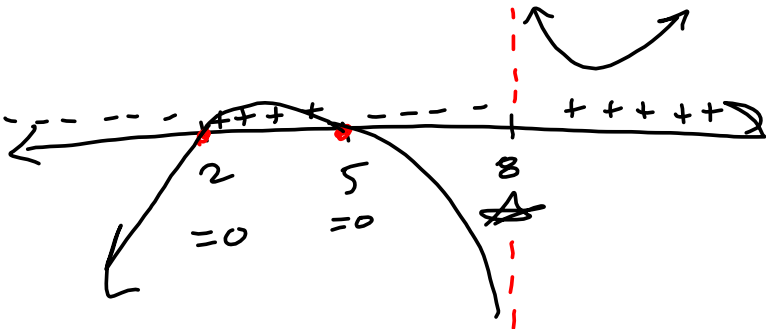
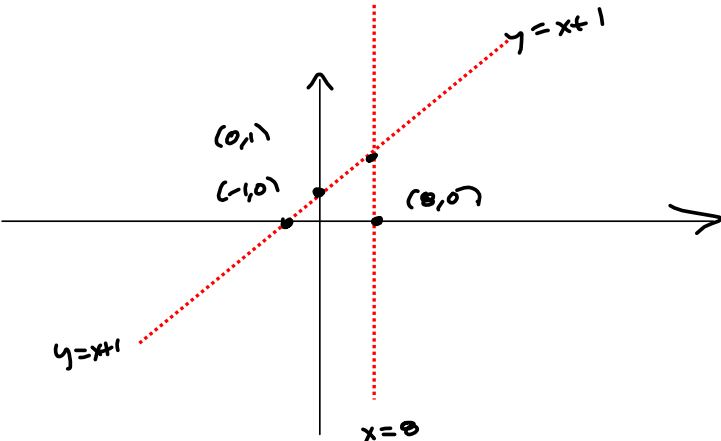
$$\begin{array}{r} x+1 \\ x-8 \overline{) x^2 - 7x - 10} \\ \underline{ x^2 - 8x } \\ x - 10 \end{array}$$

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

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

$$y = x + 1$$

$$\frac{(x-2)(x-5)}{x-8}$$



$$\begin{aligned} \mathcal{D}(f(x)) &= \mathbb{R} \setminus \{0\} = \{x \mid x \neq 0\} \\ &= (-\infty, 0) \cup (0, \infty) \end{aligned}$$