

GRAPHING HOMEWORK 2.6

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$$f(x) = \frac{(x-3)^2}{6(x-6)(x-1)}$$

a) Take the denominator of $f(x) = 0$
i.e.

$$\Rightarrow 6(x-6)(x-1) = 0$$

$$\Rightarrow (x-6)(x-1) = 0$$

$$\Rightarrow x-6 = 0, \quad x-1 = 0$$

$$\Rightarrow x = 6, \quad x = 1$$

The points $x=6$ and $x=1$ are undefined, therefore, the vertical asymptotes are:

$$x=1, \quad x=6$$

$$x=1, \text{ with multiplicity } 1$$

$$x=6, \text{ with multiplicity } 1$$

b) from part a we see that:

$$(-\infty, 1) \cup (1, 6) \cup (6, \infty)$$

$$c) y(0) = \frac{(0-3)^2}{6(0-6)(0-1)} = \frac{3^2}{36} = \frac{1}{4}$$

$$y\text{-intercept} = (0, \frac{1}{4})$$

- d) The degree of the numerator = 2
The degree of the denominator = 2

The degrees are equal;

$$y\text{-asymptote is } y = \frac{\text{numerator's leading coefficient}}{\text{denominator's leading coefficient}}$$

$$\Rightarrow y = \frac{1}{6}$$

- e) Set the numerator = 0,

$$\text{i.e. } \Rightarrow (x-3)^2 = 0$$

$$\Rightarrow x-3 = 0$$

$$\Rightarrow x = 3.$$

Substitute for x in $f(x)$

$$f(3) = \frac{(3-3)^2}{6(3-6)(3-1)} = 0.$$

So, x intercept; $(3, 0)$

f)	X-intercept/Zeros	Multiplicity	Meaning.
	3	2	Even means same side.
	Touching axis.		
	Vertical asymptotes		
	1	1	Odd Means the two
	6	1	Sides of the asymptotes
			don't match - one
			Side goes up and the
			other goes down

g) $f(x) = \frac{-(x-3)^2}{6(x-6)(x-1)}$

