

Pre-Calculus Review 2.6 & 2.7 WS

Name: **key**

Identify the following, then use these to sketch the graph of each:

$$1. \ f(x) = \frac{x-4}{4x-12} - \frac{x-4}{4(x-3)}$$

x-intercept(s) = 4

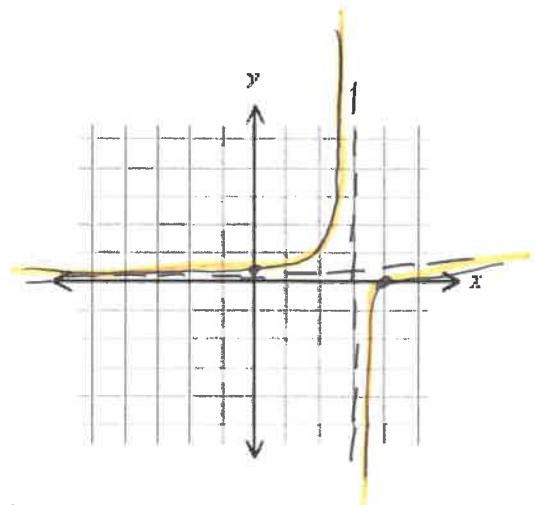
y-intercept = $\frac{1}{3}$

vertical asymptote(s) = $x=3$

horizontal asymptote = $y=\frac{1}{4}$

oblique asymptote = $y=x+\frac{1}{4}$

hole(s) = $(3, \frac{1}{3})$



$$2. \ f(x) = \frac{x^3-9x}{3x^2-6x-9} - \frac{x(x+3)(x-3)}{3(x-3)(x+1)}$$

x-intercept(s) = 0, -3

y-intercept = 0

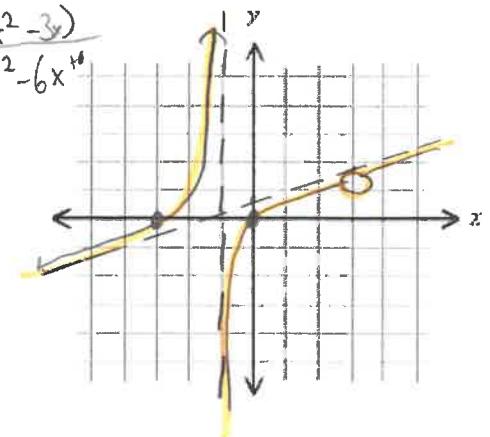
vertical asymptote(s) = $x=-1$

horizontal asymptote = $y=\frac{1}{3}x+\frac{2}{3}$

oblique asymptote = $y=\frac{1}{3}x+\frac{2}{3}$

hole(s) = $(-3, 0)$

$$\begin{array}{r} \frac{\frac{1}{3}x + \frac{2}{3}}{3x^2 - 6x - 9} \\ \hline x^3 + 0x^2 - 9x + 0 \\ -(x^3 - 2x^2 - 3x) \\ \hline 2x^2 - 6x + 0 \end{array}$$



$$3. \ f(x) = \frac{3x^2-12x}{x^2-2x-3} - \frac{3x(x-4)}{(x-3)(x+1)}$$

x-intercept(s) = 0, 4

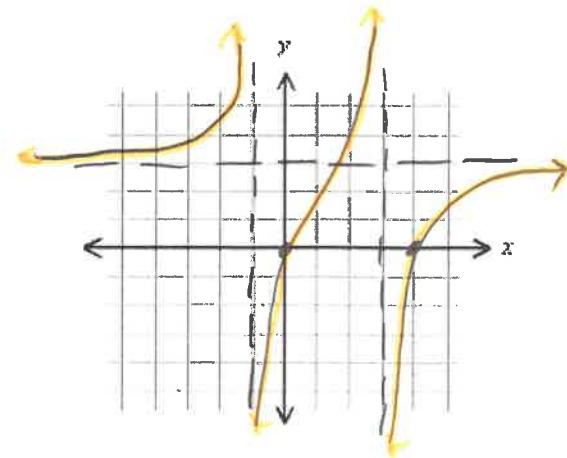
y-intercept = 0

vertical asymptote(s) = $x>3, x=-1$

horizontal asymptote = $y=3$

oblique asymptote = $y=3$

hole(s) = $(-1, 0)$



4. $f(x) = \frac{x+2}{2x^2-8} \quad \frac{x+2}{2(x+2)(x-2)}$

x-intercept(s) = $x = -2$

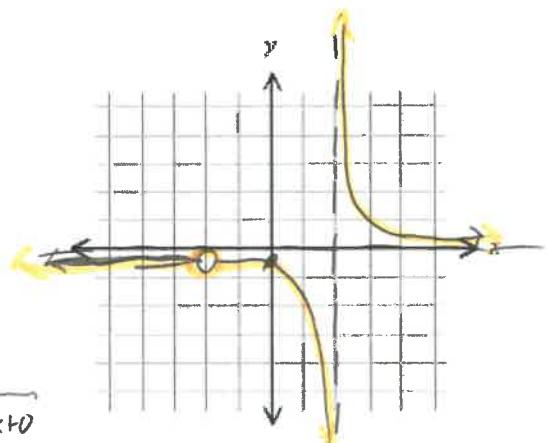
y-intercept = $-1/4$

vertical asymptote(s) = $x = 2$

horizontal asymptote = $y = 0$

oblique asymptote = $y = 0$

hole(s) = @ $x = -2$



5. $f(x) = \frac{4x^3}{x^2-3x} \quad \frac{4x^3}{x(x-3)}$

$$\begin{array}{r} 4x + 12 \\ x^2 - 3x \overline{)4x^3 + 0x^2 + 0x + 0} \\ - (4x^3 - 12x^2) \\ 12x^2 + 0x \\ \hline 12x^2 - 36x \\ 36x \end{array}$$

x-intercept(s) = $0, -3$

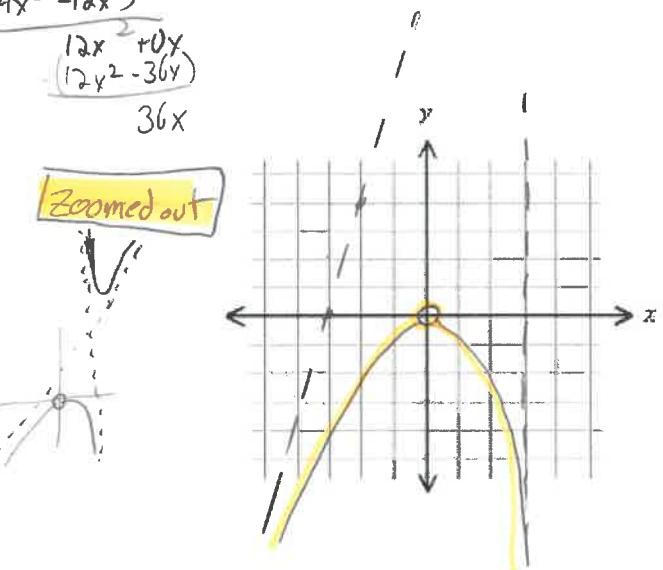
y-intercept = 0

vertical asymptote(s) = $x = 3$

horizontal asymptote = $y = 0$

oblique asymptote = $y = 4x + 12$

hole(s) = @ $x = 0$



6. ~~$f(x) = \frac{x^2-9x}{3x^2-6x-9} \quad x(x+3)(x-3)$~~

x-intercept(s) = $0, -3$

y-intercept = 0

vertical asymptote(s) = $x = -3$

horizontal asymptote = $y = 1$

oblique asymptote = $y = x + 2$

hole(s) = @ $x = 3$

$$\begin{array}{r} \frac{1}{3}x \\ 3x^2 - 6x - 9 \quad x^3 + 0x^2 - 9x + 0 \\ \hline -x^3 - 2x^2 \end{array}$$

