

Rational Functions Quest Review
NO CALCULATOR

Name: Key

1. List the following information for: $f(x) = \frac{3x^2 - 6x}{x^3 + 2x^2 - 8x}$

$$\frac{3x(x-2)}{x(x+4)(x-2)}$$

Domain: all $\mathbb{R}$ $x \neq -4, 2, 0$

Range: all $\mathbb{R}$ $y \neq 0$

Vertical asymptotes: $x = -4$

Horizontal asymptotes (if any exist): $y = 0$

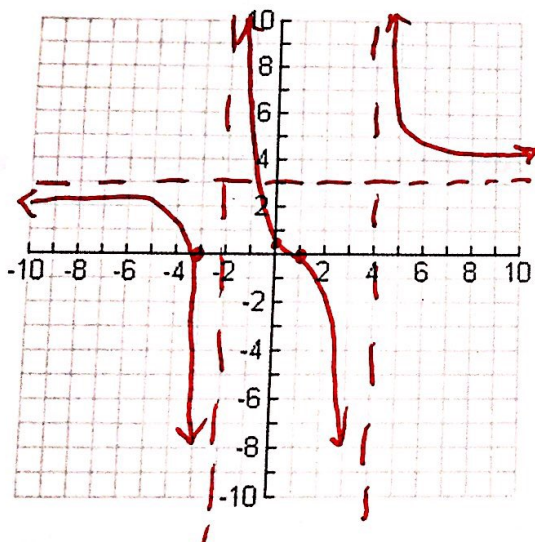
Oblique asymptotes (if any exist): -

Zeros: -

y-intercept: -

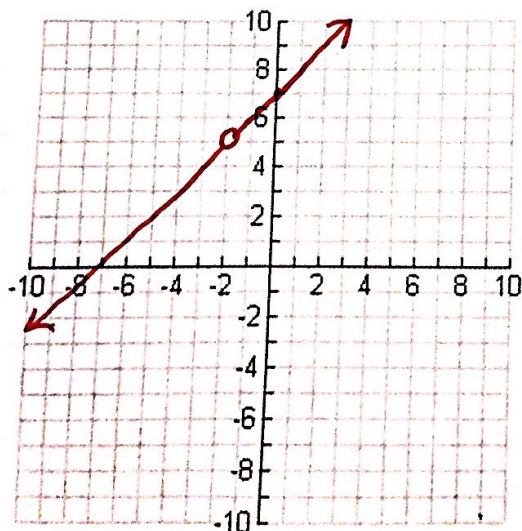
2. Graph (list all key information): $f(x) = \frac{3x^2 + 6x - 9}{x^2 - 2x - 8}$

$$\frac{3(x+3)(x-1)}{(x-4)(x+2)}$$



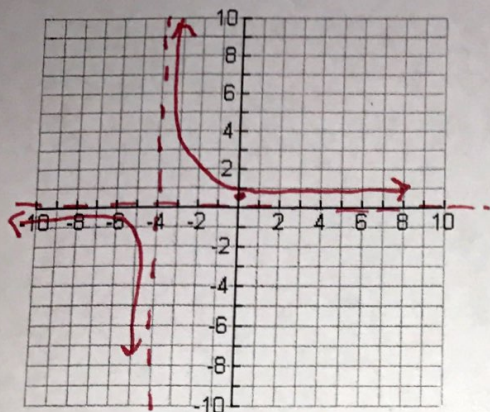
3. Graph (list all key information): $f(x) = \frac{x^2 + 9x + 14}{x + 2}$

$$\frac{(x+7)(x+2)}{x+2}$$



4. Graph the following functions, showing asymptotes, intercepts and discontinuities in the graph.

$$f(x) = \frac{1}{x+4}$$



D: all TR's $x \neq -4$

VA: $x = -4$

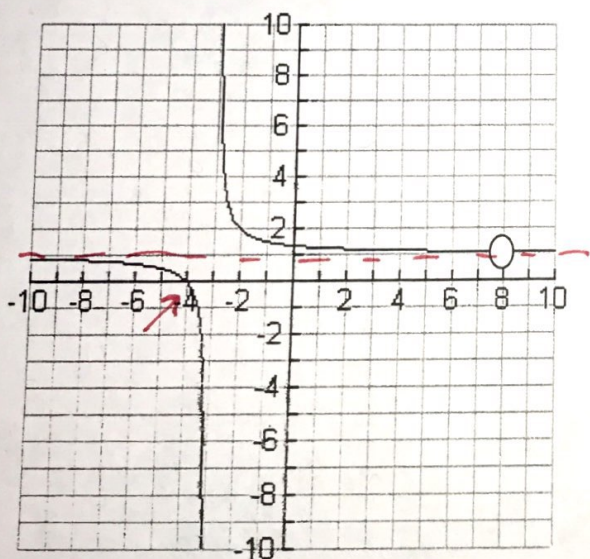
HA: $y = 0$

y int: $(0, \frac{1}{4})$

NO x-int

$$\begin{array}{r} -5 \overline{) \frac{1}{-1}} \end{array}$$

5. Write the equation of the following graph:



$$\frac{(x-8)(x+4)}{(x-8)(x+3)} = \frac{x^2 - 4x - 32}{x^2 - 5x - 24}$$

6. Solve: $\frac{(x+1)(x+2)}{x+1} - \frac{3}{x+2} = 1$

$$4x + 8 - 3x - 3 = x^2 + 3x + 2$$

$$x^2 + 2x - 3 = 0$$

$$(x+3)(x-1) = 0$$

$$x = -3, 1$$

7. Solve: $\frac{(x-7)(x+2)}{x-7} + \frac{5x}{x^2 - 5x - 14} = \frac{6}{x+2}$

$$3x + 4 + 5x = 6x - 42$$

$$2x = -48$$

$$x = -24$$