

2.4 Sketching Graphs of Rational Functions

Note Title

28/09/2012

Without a calculator, draw the graph of each:

1) $y = \frac{2x}{x+1}$

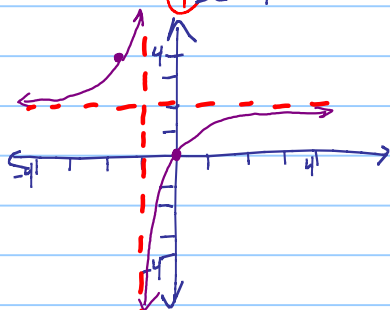
Asymptotes: $y = 2$
 $x = -1$

Intercepts: y-int:

$$x=0 \quad y = \frac{2(0)}{(0)+1} = 0$$

Plug in an x value left of $x = -1$

$$x = -2 \quad y = \frac{2(-2)}{(-2)+1} = 4$$



2) $y = \frac{2x^2 + 5x - 12}{x+2}$

$$\begin{array}{r|rrrr} -2 & 2 & 5 & -12 & \\ & & -4 & -2 & \\ \hline & 2 & 1 & -14 & \end{array}$$

Asymptotes:

$$x = -2$$

$$y = 2x + 1$$

Intercepts:

$$y = \frac{-12}{2} = -6$$

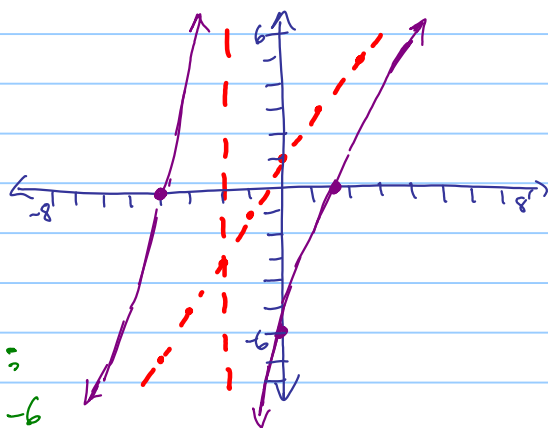
$$(x+2) \cancel{0} = \frac{2x^2 + 5x - 12}{\cancel{x+2}} \quad (x+2)$$

$$0 = 2x^2 + 8x - 3x - 12$$

$$0 = 2x(x+4) - 3(x+4)$$

$$0 = (x+4)(2x-3)$$

$$x = -4, 1.5$$



$$3) y = \frac{2x+3}{2x^2+9x+9} = \frac{\cancel{2x+3}}{(\cancel{2x+3})(x+3)} = \frac{1}{x+3}$$

$$\begin{aligned} 2x^2+9x+9 \\ 2x^2+6x+3x+9 \\ 2x(x+3)+3(x+3) \end{aligned}$$

Asymptotes: $y=0$, $x=-3$,
and a hde at $(-1.5, \frac{1}{-1.5+3})$
 $= (-1.5, 0.67)$

Plug in $x=-4$:

$$y = \frac{1}{(-4)+3} = -1$$

