

4.4 DAY 2 HOMEWORK

$$1. \frac{x^2+4x-5}{x^2+x-2} \cdot \frac{x^2-4x-12}{x^2+x-20}$$

$$\frac{\cancel{(x+5)}\cancel{(x-1)}}{\cancel{(x+2)}\cancel{(x-1)}} \cdot \frac{\cancel{(x-6)}\cancel{(x+2)}}{\cancel{(x+5)}\cancel{(x-4)}}$$

$$= \frac{x-6}{x-4}$$

$$2. \frac{2x^2+5x-3}{3x^2+2x-21} \div \frac{2x^2+9x-5}{x^2-1}$$

$$\frac{\cancel{(2x-1)}\cancel{(x+3)}}{\cancel{(3x-7)}\cancel{(x+3)}} \cdot \frac{\cancel{(x-1)}\cancel{(x+1)}}{\cancel{(2x-1)}\cancel{(x+5)}}$$

$$= \frac{(x-1)(x+1)}{(3x-7)(x+5)}$$

$$3. \frac{18}{3x-6} + \frac{3x}{2-x} = \frac{18}{3(x-2)} - \frac{3x}{x-2} \Rightarrow \frac{18-9x}{3(x-2)} = \frac{9(2-x)}{3(x-2)} = -3$$

4. Graph $h(x) = \frac{-x+3}{x-6}$ after finding characteristics of the rational function.

Vertical Asymptotes: $x=6$

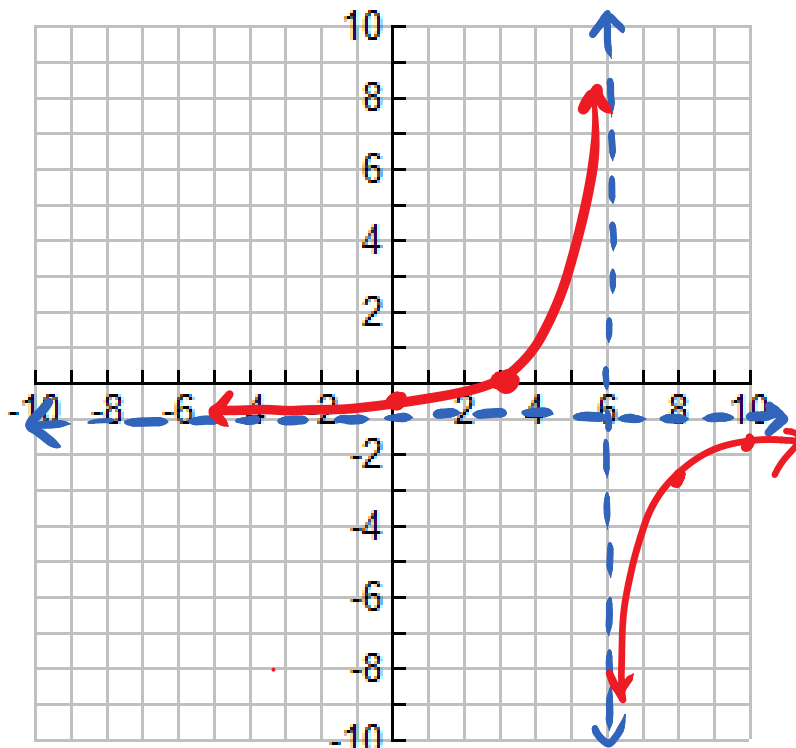
Horizontal Asymptote: $y=-1$

x-intercept: $(3,0)$

y-intercept: $(0, -1/2)$

Extra points:
(table)

$(8, -5/2)$
 $(10, -7/4)$



check for cross point:

$$-1 = \frac{-x+3}{x-6} \rightarrow -x+6 \neq -x+3$$

NO CP.

check for C.P.: (same as x int)

$$5. m(x) = \frac{3-x}{x^2+3}$$

$$0 = \frac{3-x}{x^2+3} \rightarrow 0 = 3-x \\ x = 3$$

Vertical Asymptotes: NONE

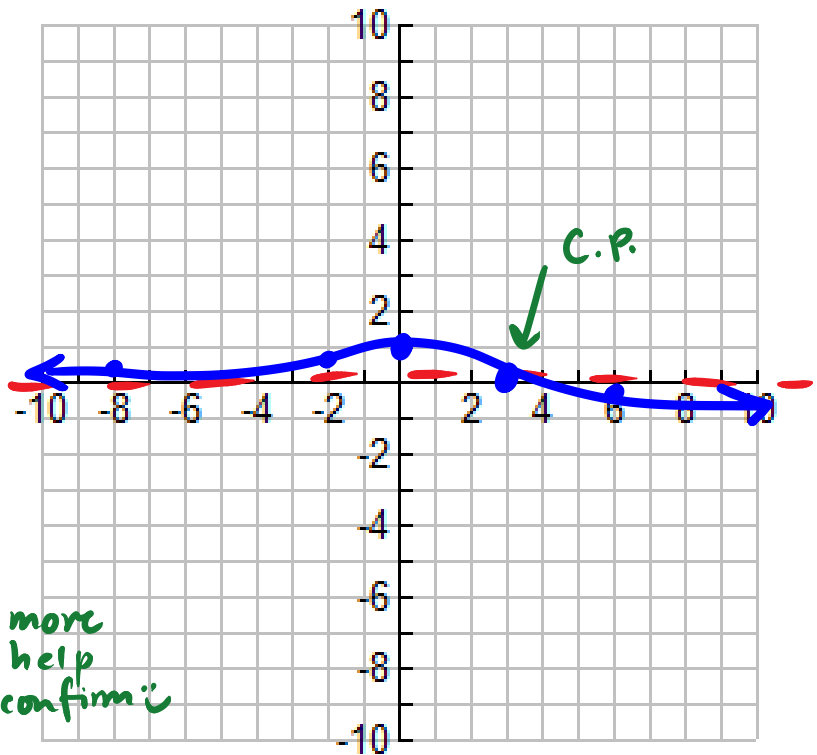
Horizontal Asymptote: $y = 0$

x-intercept: $(3, 0)$

y-intercept: $(0, 1)$

Extra points: $(-8, 1/67)$
 $(-2, 5/7)$
 $(6, -1/3)$
 $(10, -7/103)$

a few more points help you confirm



$$6. k(x) = \frac{x+5}{x^2-4}$$

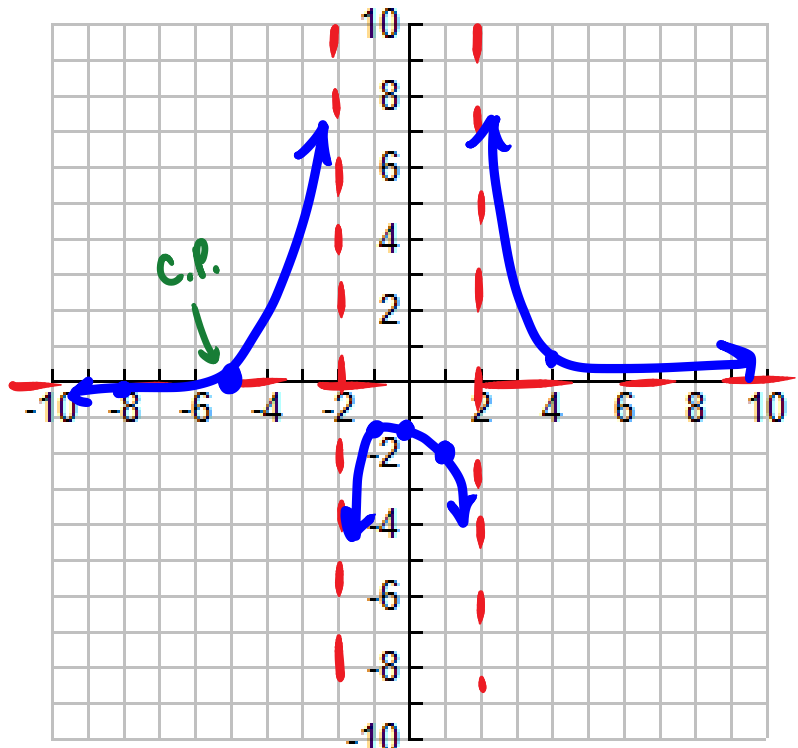
Vertical Asymptotes: $x = \pm 2$

Horizontal Asymptote: $y = 0$

x-intercept: $(-5, 0)$

y-intercept: $(0, -5/4)$

Extra points: $(1, -2)$
 $(-1, 4/3)$
 $(-8, -3/60)$
 $(4, 3/4)$



check for C.P. $0 = x+5$
(same as x int) $-5 = x$

7. Graph $h(x) = \frac{4-x}{2x^2-12x}$ after finding characteristics of the rational function.

Vertical Asymptotes:

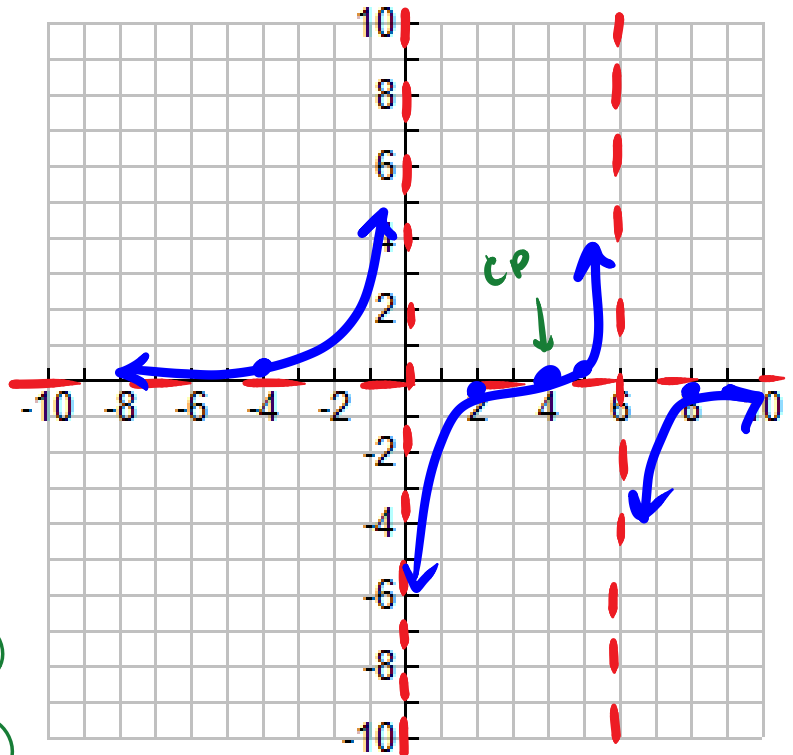
$$x=0, x=6$$

Horizontal Asymptote: $y=0$

x-intercept: $(4, 0)$

y-intercept: NONE

Extra points: $(-4, 1/10)$ $(5, 1/10)$
 $(2, -1/8)$ $(8, -1/8)$



$$8. k(x) = \frac{-3x^2+16x-5}{x^2+2x-8} = \frac{-1(3x-1)(x-5)}{(x+4)(x-2)}$$

cross point
 $-3(x^2+2x-8) = -3x^2+16x-5$
 $-3x^2-6x+24 = -3x^2+16x-5$
 $29 = 24x$
 $x \approx 1.21$

Vertical Asymptotes:

$$x=-4, x=2$$

Horizontal Asymptote:

$$y=-3$$

x-intercepts: $(13, 0), (5, 0)$

y-intercept: $(0, 5/8)$

Extra points: $(1, -8/5)$
 $(-8, -8.125)$

