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CRMA 0372
College Readiness Algebra II
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$$\frac{8x}{x^2-9x+18} \div \frac{x^2+4x}{x^2-9} \cdot \frac{x-6}{x+3}$$

$$= \frac{8x}{x^2-9x+18} \cdot \frac{x^2-9}{x^2+4x} \cdot \frac{x-6}{x+3}$$

$$= \frac{8x}{(x-6)(x-3)} \cdot \frac{(x+3)(x-3)}{x(x+4)} \cdot \frac{(x-6)}{(x+3)}$$

$$= \frac{8}{x+4}$$

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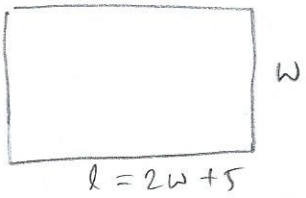
$$\frac{3x}{x^2+x-20} \cdot \frac{x^2-16}{x^2+9x} \div \frac{x+4}{x+9}$$

$$= \frac{3x}{(x+5)(x-4)} \cdot \frac{(x+4)(x-4)}{x(x+9)} \cdot \frac{(x+9)}{(x+4)}$$

$$= \frac{3}{x+5}$$

The length of a rectangle is 5m more than double the width, and the area of the rectangle is 63 m^2. Find the dimensions of the rectangle.



let. l = length $\quad l = 2w + 5$

w = width

$$lw = 63$$

$$w(2w+5) = 63$$

$$2w^2 + 5w = 63$$

$$2w^2 + 5w - 63 = 0$$

$$(2w-9)(w+7) = 0$$

$2w-9 = 0$ OR $w+7 = 0$

$w = 9/2$ $\quad$ $w = -7$

$w = 4.5$ m

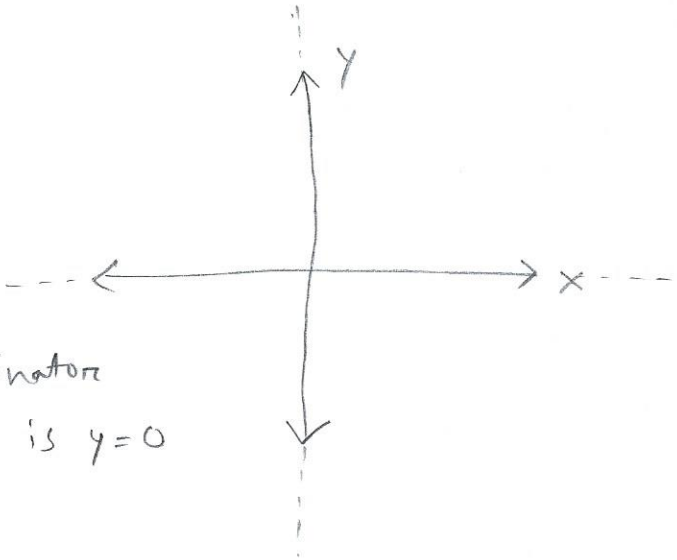
$l = 2(\frac{9}{2}) + 5$

$= 14$ m

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

$x \neq 0$

if the degree of the numerator is less than the degree of the denominator the horizontal asymptote is $y = 0$



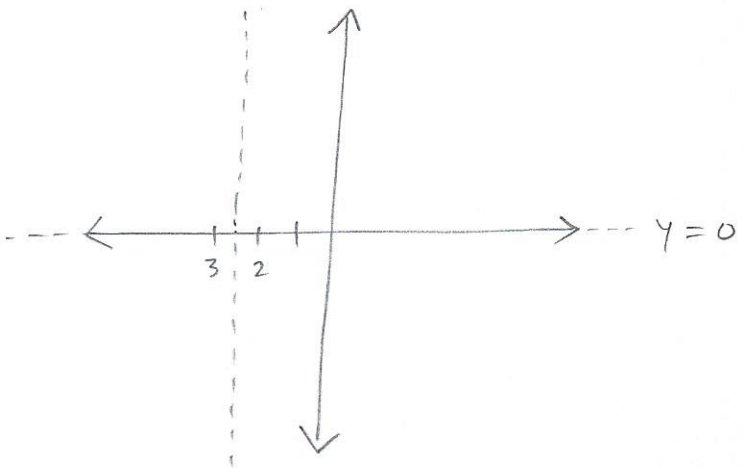
$$f(x) = \frac{-3}{-4x-10}$$

vertical asymptote $x = -2.5$

$-4x - 10 \neq 0$

$\frac{-4x}{-4} \neq \frac{10}{-4}$

$x \neq -\frac{5}{2}$

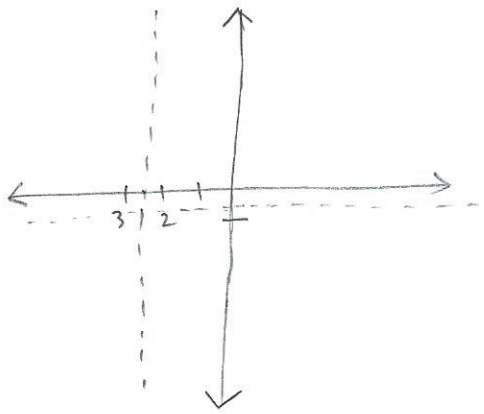


if the degree of the numerator & denominator are the same, divide the leading coefficients to find the horizontal asymtote.

$f(x) = \frac{2x+5}{-4x-10}$ vertical asymtote $x = -2.5$

horizontal asymptote $y = -\frac{2}{4}$

$y = -\frac{1}{2}$



if the degree of the numerator is greater than the degree of the denominator, there are no horizontal asymptotes.

$f(x) = \frac{2x^2+5}{-4x-10}$

Review:

Exponent Rules

1) $(2x^3y^2)(5x^2y) = 10x^5y^3$

2) $\frac{r^2}{2r^3} = \frac{1}{2r}$

3) $\frac{x^{-5}}{x^{-3}} = \frac{x^3}{x^5} = x^{-2} = \frac{1}{x^2}$

4) $(3m^2)^{-2} = 3^{-2}m^{-4} = \frac{1}{3^2m^4} = \frac{1}{9m^4}$

5) $\frac{4x^0y^{-2}z^3}{4x} = \frac{z^3}{xy^2}$

6) $\left(\frac{3}{5}\right)^{-3} = \left(\frac{5}{3}\right)^{3} = \frac{5^3}{3^3} = \frac{125}{27}$

Polynomial long division

7) $(4x^2+14x+12) \div (2x+4) = 2x+3$

$$\begin{array}{r} 2x+3 \\ 2x+4 \overline{)\,4x^2+14x+12} \\ \underline{4x^2+8x\ \downarrow} \\ 6x+12 \\ \underline{6x+12} \\ 0 \end{array}$$

Polynomial long division OR synthetic division

8) $(x^2+5x+4) \div (x+2)$

$$= x+3+\frac{-2}{x+2}$$

$$\begin{array}{r|ccc} & 1 & 5 & 4 \\ -2 & \downarrow & -2 & -6 \\ \hline & 1 & 3 & -2 \end{array}$$

Simplifying Rational expressions

9) $\frac{-70n^5}{28n^2} = \frac{-5}{2n^3}$

10) $\frac{x+6}{x^2+5x-6} = \frac{(x+6)}{(x+6)(x-1)} = \frac{1}{x-1}$

11) $\frac{3x^2-39x+90}{x^2-3x-70} = \frac{3(x^2-13x+30)}{x^2-3x-70} = \frac{3(x-3)(x-10)}{(x-10)(x+7)} = \frac{3(x-3)}{x+7}$

12) $\frac{2x}{x^2+5x-6} \div \frac{x^2-3x}{x^2-36} \cdot \frac{x-3}{x-6}$

$$= \frac{2x}{(x+6)(x-1)} \cdot \frac{(x+6)(x-6)}{x(x-3)} \cdot \frac{(x-3)}{(x-6)}$$

$$= \frac{2}{x-1}$$