DRILL

① Find vertical asymptote(s) for: $f(x) = \dfrac{4x}{x^2+4x-12}$

ADD MULT

$x^2+4x-12 = 0$

$(x+6)(x-2) = 0$

$x+6=0$ $\quad x-2=0$

$-6\ -6$ $\quad +2\ +2$

$x=-6$ $\quad x=2$

② Find horizontal asymptote for: $f(x) = \dfrac{2x^2-1}{6x^2-2x+1}$

(SAME DEGREE)

$y = \dfrac{2}{6} = \dfrac{1}{3}$

$y = \dfrac{1}{3}$

Solve rational equations with cross multiplication

* If $\frac{a}{b} = \frac{c}{d}$, then $ad = bc$

Ex: $\frac{4}{5} = \frac{x}{20}$

$4(20) = 5x$

$\frac{80}{5} = \frac{5x}{5}$

$16 = x$

$x = 16$

Ex: $\frac{x+2}{x+1} = \frac{x+4}{x+2}$

(*) $(x+2)(x+2) = (x+1)(x+4)$

$x^2 + 2x + 2x + 4 = x^2 + 4x + 1x + 4$

$x^2 + 4x + 4 = x^2 + 5x + 4$

$-x^2 \qquad -x^2$

$4x + 4 = 5x + 4$

$-4x \qquad -4x$

$4 = x + 4$

$-4 \qquad -4$

$0 = x$

$x = 0$

Ex:

$$\frac{x+5}{x-3} = \frac{x+6}{x-1}$$

$$(x+5)(x-1) = (x-3)(x+6)$$

$$x^2 - 1x + 5x - 5 = x^2 + 6x - 3x - 18$$

$$x^2 + 4x - 5 = x^2 + 3x - 18$$

$$4x - 5 = 3x - 18$$

$$-3x \qquad -3x$$

$$x - 5 = -18$$

$$+5 \qquad +5$$

$$\boxed{x = -13}$$

Ex:

$$\frac{x+6}{x-4} = \frac{x+2}{x+3}$$

① $(x+6)(x+3) = (x-4)(x+2)$

② $x^2 + 3x + 6x + 18 = x^2 + 2x - 4x - 8$

③ $x^2 + 9x + 18 = x^2 - 2x - 8$

④ $9x + 18 = -2x - 8$ (+2x, +2x)

⑤ $11x + 18 = -8$ (−18, −18)

⑥ $\frac{11x}{11} = \frac{-26}{11}$

⑦ $x = \frac{-26}{11}$