

GRAPHING INEQUALITIES

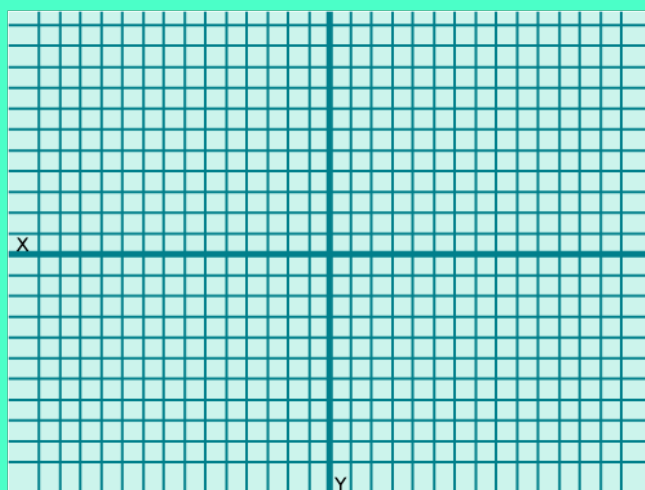
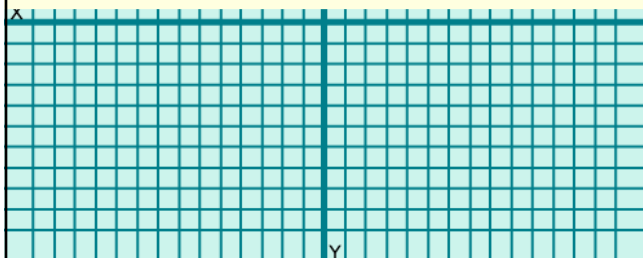
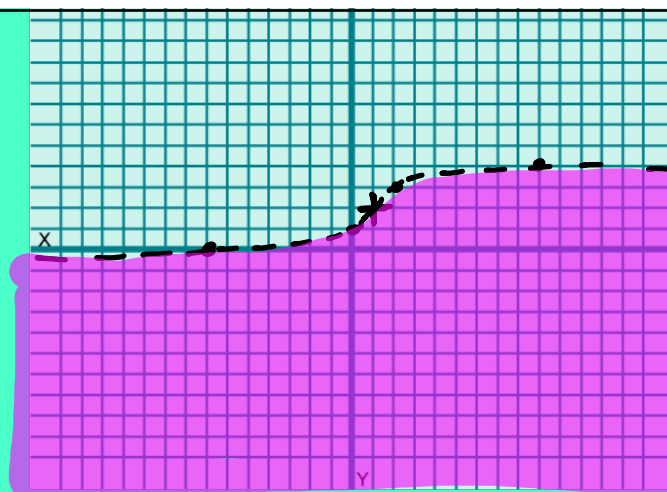
$$y < \sqrt[3]{x-1} + 2$$

$<, >$ dotted

$\leq, \geq$ solid

$y <$ shade below
 $y >$ shade above

$$\begin{array}{r} 0 \\ 8 \overline{) 0} \\ 0 \\ \hline 2 \end{array}$$



ASYMPTOTES - Rational Functions

Vertical

Where denom = 0

Horizontal

Use highest power of x
- Pull that power from
num. + denom.

$$y = \frac{8x^2 + 2x + 1}{2x^2 - 8}$$

Vertical

$$\begin{aligned} 2x^2 - 8 &= 0 \\ 2(x^2 - 4) &= 0 \\ 2(x+2)(x-2) &= 0 \\ x &= 2, -2 \end{aligned}$$

$$\boxed{x=2, x=-2}$$

Horiz

$$\frac{8x^2}{2x^2} = 4$$

$$\boxed{y=4}$$

$$y = \frac{4x-3}{2x^2+7}$$

Vertical

$$2x^2 + 7 = 0$$

$$\begin{aligned} 2x^2 &= -7 \\ \sqrt{x^2} &= \sqrt{-\frac{7}{2}} \end{aligned}$$

imag.

$\boxed{\text{None}}$

Horiz

$$\frac{0x^2}{2x^2} = 0$$

$$\boxed{y=0}$$

$$y = \frac{4x^3 + 2x^2 + 7}{x^2 - 5x}$$

Vert.

$$x^2 - 5x = 0$$

$$x(x-5) = 0$$

$$\boxed{x=0 \quad x=5}$$

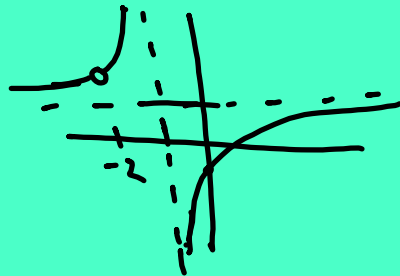
Horiz

$$\frac{4x^3}{0x^3}$$

$\boxed{\text{None}}$

$$f(x) = \frac{x^2 - 4}{x^2 + 3x + 2} = \frac{(x-2)\cancel{(x+2)}}{(x+1)\cancel{(x+2)}}$$

Holes occurs when
terms cancel from
the num. + denom.



Hole at $x = -2$

Vertical at $x = -1$

Horizontal $\frac{x^2}{x^2} = 1$
 $y = 1$

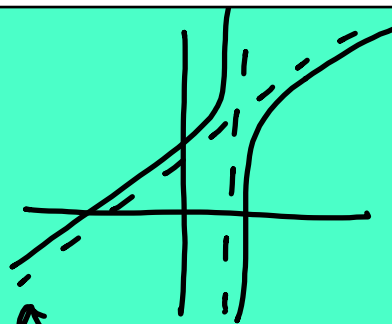
Slant (Oblique) Asymptotes

the numerator is one power higher than the denominator

$$f(x) = \frac{4x^2 + 7}{2x - 1}$$

Vertical
 $2x - 1 = 0$
 $\boxed{x = \frac{1}{2}}$

Horiz
 $\frac{4x^2}{0x^2}$
 None



$$y = mx + b$$

Find slant asymptotes by performing long division

$$\begin{array}{r} 2x + 1 \\ 2x - 1 \overline{) 4x^2 + 0x + 7} \\ \underline{-4x^2 + 2x} \\ 2x + 7 \end{array}$$

$\boxed{y = 2x + 1}$