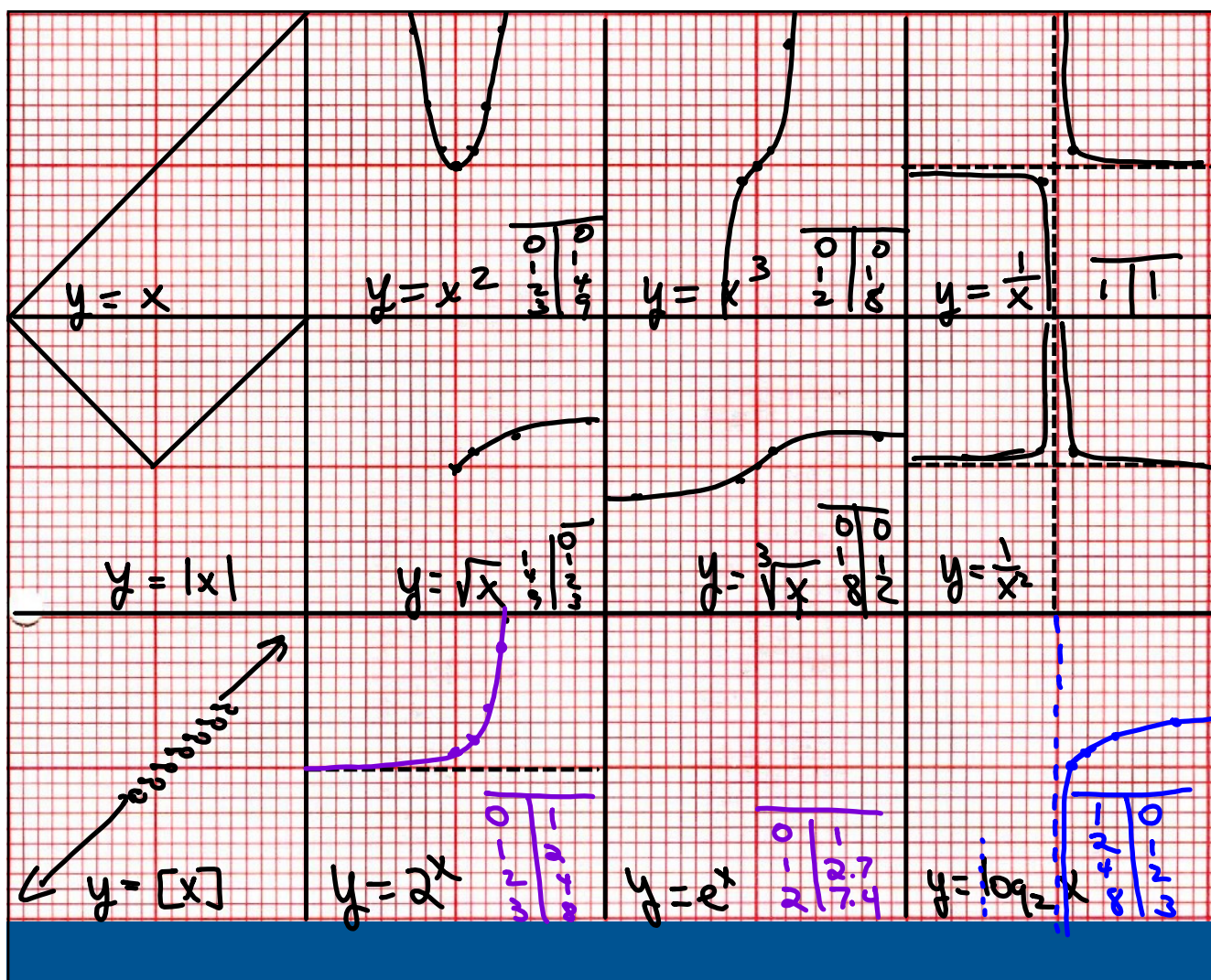




$$y < -2\sqrt[3]{4-x} + 2$$

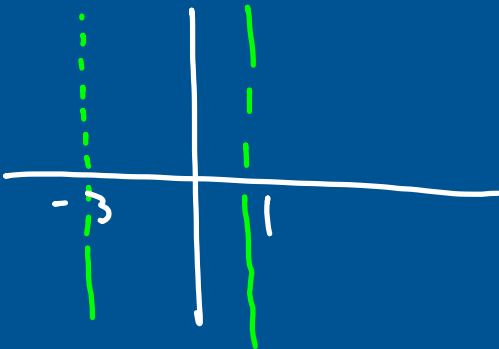
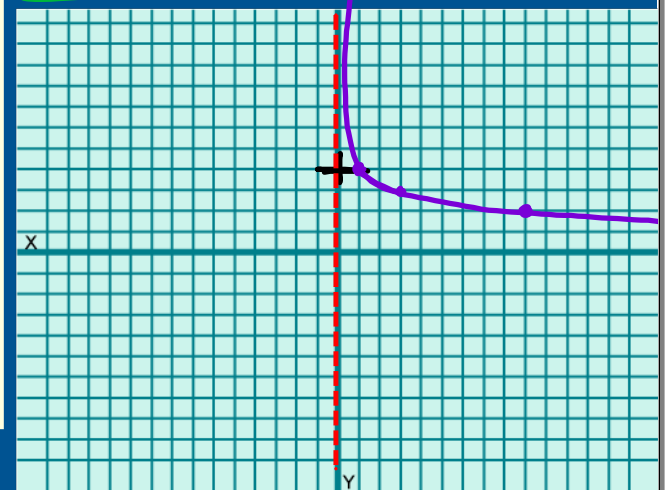
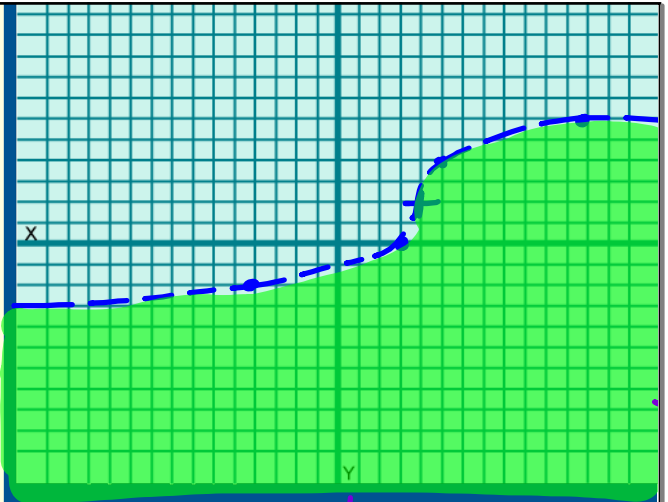
$-(x-4)$ up 2
 Right 4

0	0
-1	-2
-8	-4

$$y = -\log_3(x) + 4$$

1	0
3	-1
9	-2

up 4



$$x < -3$$

$$-3 \leq x \leq 1$$

$$x > 1$$

$$\sqrt{2x+1} - \sqrt{x-3} = 2$$

$$(\sqrt{2x+1})^2 = (2 + \sqrt{x-3})^2$$

$$(2 + \sqrt{x-3})(2 + \sqrt{x-3})$$

1) Isolate a root

2) Square both sides
Repeat.

$$2x+1 = 4 + 2\sqrt{x-3} + 2\sqrt{x-3} + x-3$$

$$\begin{array}{r} 2x+1 \\ -x-1 \\ \hline \end{array} = \begin{array}{r} 1+x+4\sqrt{x-3} \\ -1-x \\ \hline \end{array}$$

$$(x)^2 = (4\sqrt{x-3})^2$$

$$x^2 = 16(x-3)$$

$$x^2 = 16x - 48$$

$$x^2 - 16x + 48 = 0$$

$$(x-4)(x-12) = 0$$

$$x=4 \quad x=12$$

$$x=4 \quad \sqrt{9} - \sqrt{1} = 2$$

$$3-1=2 \checkmark$$

$$x=12 \quad \sqrt{25} - \sqrt{9} = 2$$

$$5-3=2 \checkmark$$

Solve

$$14(b) \quad x^4 - 4x^3 - 7x^2 + 34x - 24 = 0$$

$$\underline{\hspace{2cm}} \mid x=1$$

$$1 - 4 - 7 + 34 - 24 = 0$$

$$\begin{array}{ll} \pm 1 & \pm 24 \\ \pm 2 & \pm 12 \\ \pm 3 & \pm 8 \\ \pm 4 & \pm 6 \end{array}$$

$$\begin{array}{r|rrrrrr} 1 & 1 & -4 & -7 & 34 & -24 \\ & & 1 & -3 & -10 & 24 \\ \hline & 1 & -3 & -10 & 24 & 0 \end{array}$$

$x=1$
 $x-1$
 multiply
 * box

$$(x-1)(x^3 - 3x^2 - 10x + 24)$$

$$\underline{\hspace{2cm}} \mid x=2 \quad 0$$

$$\begin{array}{r|rrrr} 2 & 1 & -3 & -10 & 24 \\ & & 2 & -2 & -24 \\ \hline & 1 & -1 & -12 & 0 \end{array}$$

$$(x-1)(x-2)(x^2 - x - 12)$$

$$(x-4)(x+3)$$

$$\boxed{x=1, 2, -3, 4}$$

Rational Func.

* multiply by
common denom +
cancel all denom

Excluded values $x \neq -1, 3$

$$\left[\frac{4}{x+1} = \frac{2}{x-3} + 5 \right]$$

$$4(x-3) = 2(x+1) + 5(x+1)_{(x-3)}$$

$$4x-12 = 2x+2+5(x^2-2x-3)$$

$$4x - 12 = 2x + 2 + 5x^2 - 10x - 15$$

Rat. Func $\geq$, $\leq$

- 1) Set < 0 or > 0
- 2) Make common denom.
- 3) Test points

$$\frac{5}{x+3} \leq \frac{2}{x-4}$$

$$\frac{(x-4)5}{(x-4)x+3} - \frac{2(x+3)}{x-4(x+3)} \leq 0$$

$$\frac{5x-20-2x-6}{(x+3)(x-4)} \leq 0$$

$$\frac{3x-26}{(x+3)(x-4)} \leq 0$$

need
neg.
Solutions

$$= \frac{1}{-3} + \frac{1}{4} + \frac{1}{26}$$

$$(-\infty, -3) \cup (4, \frac{26}{3}]$$

PARTIAL FRACTIONS

$$\frac{\text{~~~~~}}{(x+5)(x^2+6)} = \frac{A}{x+5} + \frac{Bx+C}{x^2+6}$$

$$\frac{x^3(x+4)^2}{\overline{x} \overline{x^3}} = \frac{E}{\frac{x^3}{(x')^3}} + \frac{D}{\frac{x^2}{(x')^2}} + \frac{C}{x} + \frac{B}{(x+4)^2} + \frac{A}{x+4}$$

16(a)

$$\frac{6x^2 - 11x - 8}{x^3 - x^2 - 2x} = \frac{A}{x} + \frac{B}{x-2} + \frac{C}{x+1}$$

$x(x-2)(x+1)$
 $x^3 - x^2 - 2x$
 $x(x^2 - x - 2)$
 $x(x-2)(x+1)$

$$6x^2 - 11x - 8 = \frac{A(x-2)(x+1) + Bx(x+1) + Cx(x-2)}{x^2 - x - 2}$$

$$6x^2 - 11x - 8 = Ax^2 - Ax - 2A + Bx^2 + Bx + Cx^2 - 2Cx$$

$$\begin{aligned} 6 &= A + B + C \\ -11 &= -A + B - 2C \\ -8 &= -2A \end{aligned}$$

$$\begin{bmatrix} 1 & 1 & 1 \\ -1 & 1 & -2 \\ -2 & 0 & 0 \end{bmatrix}^{-1} \cdot \begin{bmatrix} 6 \\ -11 \\ -8 \end{bmatrix}$$

$$= \begin{bmatrix} 4 \\ -1 \\ 3 \end{bmatrix}$$

$$\frac{4}{x} + \frac{-1}{x-2} + \frac{3}{x+1}$$