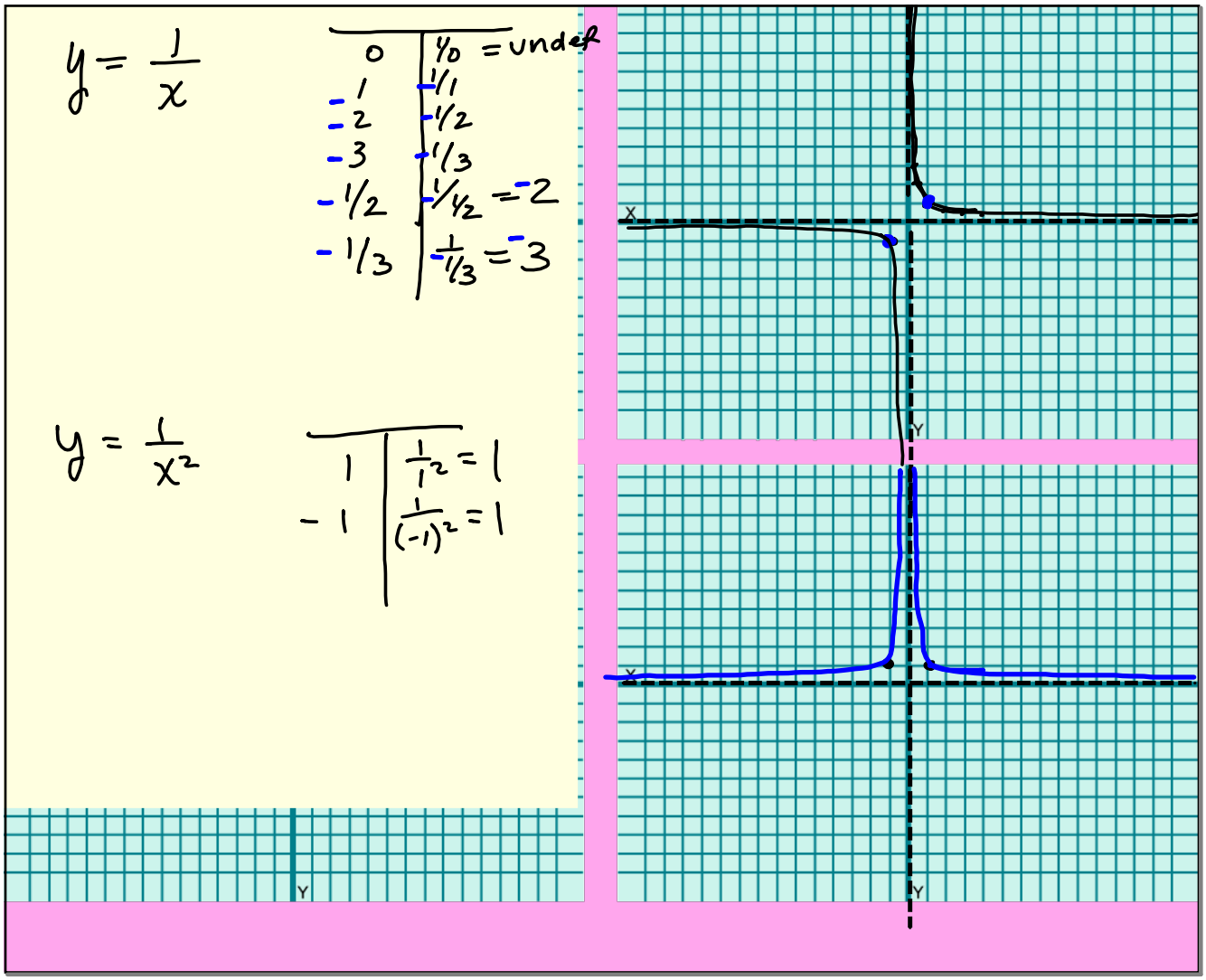
February 10, 2023



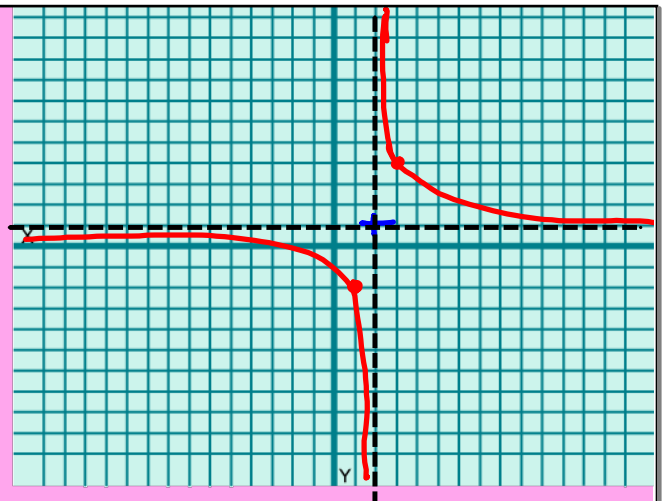
$y = \frac{3}{x-2} + 1$

Right 2

Up 1

| 1 | x-3 |

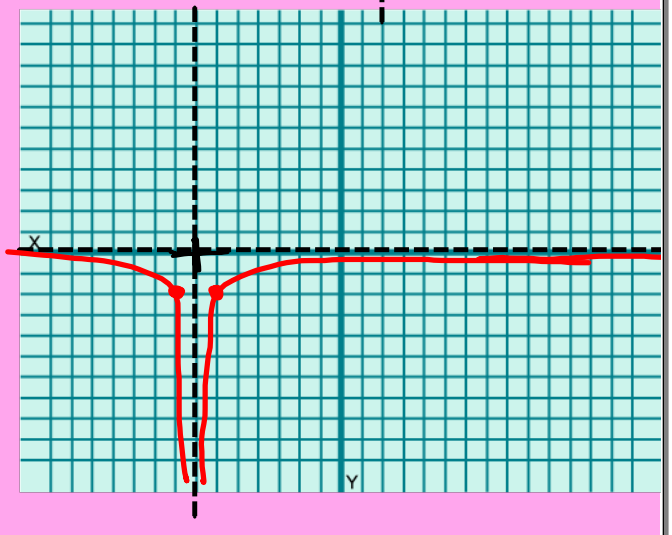
butterfly

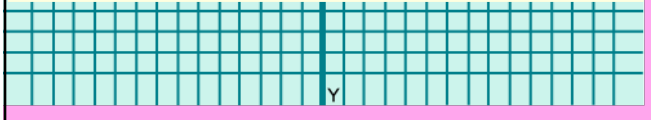


$y = \frac{-2}{(x+7)^2}$

left 7

| 1 | x-2 |





Boat - 15 $\frac{Km}{h}$

$60 \frac{mi}{h} * 2\,hr = 120\,mi$

$R * T = D$

$T = \frac{D}{R}$

$R = \frac{D}{T}$

$D \div R = T$

	D	R	T
down	140	15+x	$\frac{140}{15+x}$
up	35	15-x	$\frac{35}{15-x}$

x = speed of river

$x \neq -15, 15$

boat ± river
plane ± wind

$(15+x)(15-x)\left[\frac{140}{15+x} = \frac{35}{15-x}\right](15+x)(15-x)$

$140(15-x) = 35(15+x)$

$2100 - 140x = 525 + 35x$

$-525 \quad +140x$

$\frac{1575}{175} = \frac{175x}{175}$

$9\,Km/h = x$

Total trip took 4 hrs.
(Sum)

$\frac{140}{15+x} + \frac{35}{15-x} = 4$

Upstream time was $\frac{3}{4}$ hr longer than downstream.

More time − Less time = $\frac{3}{4}$

Upstream − Down = $\frac{3}{4}$

2/

	D	÷ R	= T
normal speed	270	x	$\frac{270}{x}$
increased speed	270	$x+9$	$\frac{270}{x+9}$

x = avg speed

$x \neq 0, -9$

More Time − Less Time

$$\frac{x}{(x+9)}\left[\frac{270}{x} - \frac{270}{x+9} = 1\right] x(x+9)$$

$$270(x+9) - 270x = x(x+9)$$

$$270x + 2430 - 270x = x^2 + 9x$$

$$0 = \underset{a}{x^2} + \underset{b}{9}x - \underset{c}{2430}$$

$$x = \frac{-9 \pm \sqrt{81 - 4(1)(-2430)}}{2(1)}$$

$$= \frac{-9 \pm \sqrt{81 + 9720}}{2} = \frac{-9 \pm \sqrt{9801}}{2}$$

$$\frac{-9 \pm 99}{2} = 45 \text{ or } -54$$

45 mph

Hint #5:

Bus = $1000

10 people go: $\frac{1000}{10}$ = $100 per person

20 people go: $\frac{1000}{20}$ = $50 per person

$$\frac{\text{Cost}}{\text{\# people}}$$