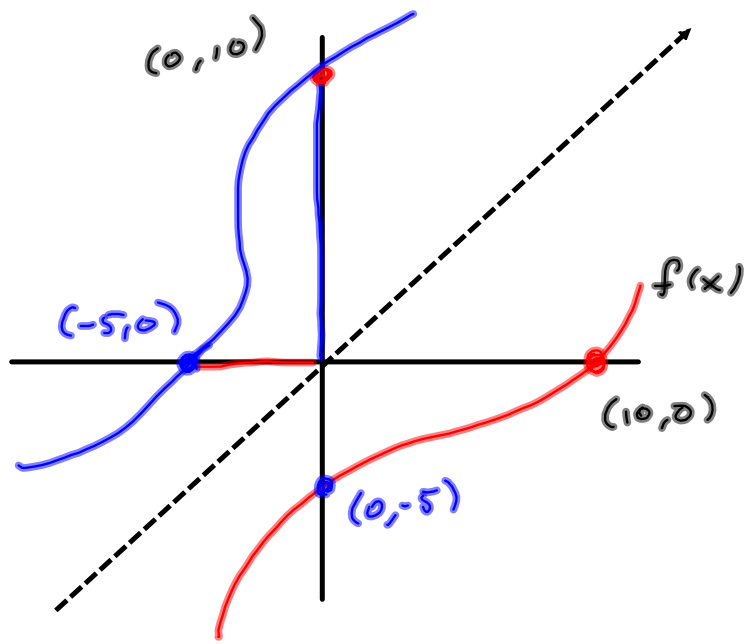


Sec	Probs
2.1	#s 1 – 8, 13, 14, 17 – 20, 23 – 28, 33 – 36, 55, 56, 71 – 74, 83, 84, 87, 88, 91, 92, 95, 96
2.2	#s 10, 11, 13, 14, 21, 22, 35 – 40, 49, 51, 53, 54, 69, 71, 72
2.3	#s 11 – 22, 29 – 42, 45 – 50, 55 – 66, 89, 90
2.4	#s 1 – 10, 15, 16, 24, 26, 28, 30 – 33, 37 – 42, 51, 52, 63, 66, 68, 73, 74, 81, 82
2.5	#s 5 – 8, 11 – 14, 16 – 30, 49efgh, 50efgh, 51 – 62, 69 – 74, 83, 84
2.6	#s 1 – 18, 25 – 28, 37 - 40



Graph $f^{-1}(x)$

(x,y) on f 's graph,
 $\Rightarrow (y,x)$ on f^{-1} 's.

$$f \approx d \quad f^{-1}$$

$$f(x) = \frac{x+1}{x-2} = y$$

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

$$\underline{y+1} = x(y-2) = \underline{xy-2x}$$

$$y+1-xy = -2x$$

$$y-xy = -2x-1$$

$$y(1-x) = -2x-1$$

$$y = \frac{-2x-1}{1-x} = f^{-1}(x)$$

Bonus Prove $f(x)$ is 1-to-1 (algebraically)

$f(x)$ is 1-to-1 if

$$f(x_1) = f(x_2) \implies x_1 = x_2$$

Method:

$$\frac{x_1+1}{x_1-2} = \frac{x_2+1}{x_2-2} \implies x_1 = x_2$$

Try to solve for x_1 : *Fill in any gaps in the steps @ home.*

$$(x_1+1)(x_2-2) = (x_2+1)(x_1-2)$$

$$x_1x_2 - 2x_1 + x_2 - 2 = x_2x_1 - 2x_2 + x_1 - 2$$

$$-2x_1 + x_2 = -2x_2 + x_1$$

$$-3x_1 = -3x_2$$

$$x_1 = x_2 \quad \square$$

§ 2.6 Proportionality "Direct Variation"

y is proportional to x

$$y = kx$$

y varies directly with (or "as") x .

y is proportional to x .

$y = 5$ when $x = 2$. What's y when $x = 3$?

$$y = kx$$

$$5 = k \cdot 2$$

$$\frac{5}{2} = k = \text{Constant of proportionality.}$$

$$y = y(x) = \frac{5}{2}x, \text{ so}$$

$$y(3) = \frac{5}{2} \cdot 3 = \boxed{\frac{15}{2} = y}$$

These "direct variation" relations are all lines thru the origin.

$$y = mx + 0$$

$$y = kx$$

$$\frac{y}{x} = k \quad \text{Constant ratio between } y \text{ \& } x \text{ (or } x \text{ \& } y)$$

Joint Variation $y = kxw$
 y varies jointly as x & w

Inverse Variation
 y varies inversely with x .
 $y = \frac{k}{x}$

Sound (and light) varies inversely with
 the ^{square} of the distance
 $y = \frac{k}{d^2}$

y varies jointly with x and the cube of z
 and inversely with the 7th root of w .

$$y = \frac{kxz^3}{\sqrt[7]{w}}$$

$$F = G \frac{m_1 m_2}{r^2}$$

G = Gravitational constant

m_1 = mass of body 1

m_2 = " " " " 2

r = distance between barycenters.

Tuesday Practice Test #2
Midterm looming