

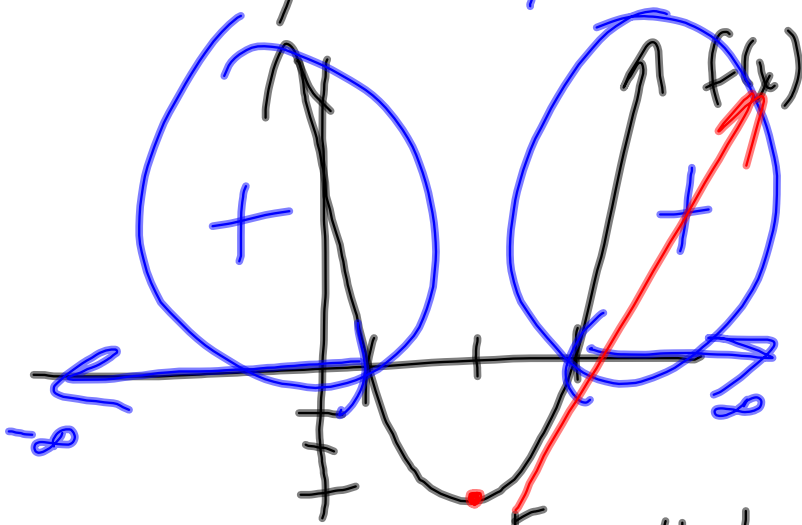
(a) domain:
 $(-\infty, \infty)$

(y) range:
 $[-3, \infty)$

(b) x-int $x = 1, 3$
 y-int $y = 9$

$(1, 0)$ $(3, 0)$

$(0, 9)$



For what values
of x is $\frac{f(x)}{y}$
positive?

$(-\infty, 1)$ $(3, \infty)$

For what values of x
is $f(x)$ increasing?

$(2, \infty)$

$$d8) f(x) = \frac{2x}{x-2}$$

(a) Is $(\frac{1}{2}, -\frac{4}{3})$ on graph? YES

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

(b) If $x=4$, what is $f(x)$? $= \frac{1}{-3/2} = -2/3$

$$f(4) = \frac{2(4)}{4-2} = \frac{8}{2} = 4$$

(c) If $f(x)=1$, what is x ?

$$\cancel{x-2} \frac{2x}{\cancel{x-2}} = 1(x-2) \rightarrow \underline{2x = x-2}$$

$$\begin{array}{r} 2x = x - 2 \\ -x \quad -x \\ \hline x = -2 \end{array}$$

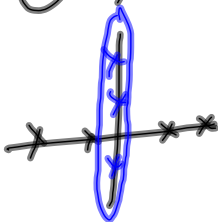
(d) domain: $f(x) = \frac{2x}{x-2}$

denom $\neq 0$

$$\begin{array}{r} x-2 \neq 0 \\ +2 \quad +2 \\ \hline \end{array}$$

$$x \neq 2$$

(e) x-intercepts ($y=0$)



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

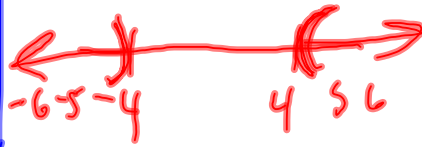
$$\frac{2x}{2} = \frac{0}{2} \\ x=0$$

(f) y-intercept $f(0) = \frac{2(0)}{0-2} = \frac{0}{-2} = 0$

$$|x| = 3$$

$$x = \pm 3$$

$$|x| > 4$$



$$x < -4 \text{ or } x > 4$$

$$|x| < 5$$



$$-5 < x < 5$$

$$\frac{4}{4} |3x+3| = \frac{6}{4}$$

$$|3x+3| = \frac{3}{2}$$

$$3x+3 = \frac{3}{2}$$

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

$$\frac{6x}{6} = \frac{-3}{6}$$

$$x = \frac{-3}{6} = -\frac{1}{2}$$

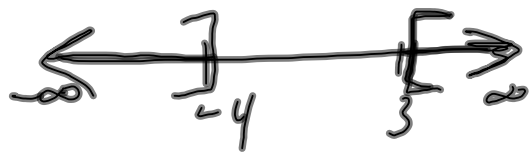
$$3x+3 = -\frac{3}{2}$$

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

$$\frac{6x}{6} = \frac{-9}{6}$$

$$x = -\frac{3}{2}$$

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



$$|2x+1| \geq 7$$

$$\frac{2x+1}{-1 \quad -1} \leq \frac{-7}{-1} \quad \text{or} \quad \frac{2x+1}{-1 \quad -1} \geq \frac{7}{-1}$$

$$\frac{2x}{2} \leq \frac{-8}{2}$$

$$x \leq -4$$

$$(-\infty, -4]$$

$$\frac{2x}{2} \geq \frac{6}{2}$$

$$x \geq 3$$

$$[3, \infty)$$

Uniform Motion:

$$d = r \cdot t$$

A boat travels upstream on a river with a current of 4 mph.

The upstream trip takes 4 hrs & the return trip takes 2.5 hrs. How fast is the motorboat travelling in still water?

Upstream:

$$d = (r - 4) 4$$

Downstream:

$$d = (r + 4) 2.5$$

$$4(r - 4) = 2.5(r + 4)$$

$$\begin{array}{r} 4r - 16 = 2.5r + 10 \\ -2.5r + 16 \quad -2.5r + 10 \\ \hline \end{array}$$

$$\frac{1.5r}{1.5} = \frac{26}{1.5} = \frac{52}{3} \approx 17.3 \text{ mph}$$