

create the graph of
 $\frac{1}{g(x)}$

- Reciprocal Functions
 - properties
 - graph
- Rational Equations
 - word problems/models
 - restrictions
 - solving
- Rational Inequalities
 - restrictions
 - solving
- Rates of Change
- Graph rational functions

$$\frac{\text{linear}}{\text{linear}} \quad \text{ie.} \quad \frac{3x-2}{2x+1}$$

pg 308 1b^{*}, 2a, 3^{***}, 5ad, 7b^{**}, 9, 10bd^{**}, 12a

** do not verify with desmos answers
rounded ok!

* create the graph

$$R: \{y \in \mathbb{R} \mid y \geq -10.125\}$$

Decreasing on $(-\infty, -1.75)$

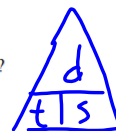
Increasing on $(-1.75, \infty)$

*** 3a) HA: $y=0$

3c) HA: $y=0$

3d) has OA (don't have to find it)

2. Dieter makes a journey of 430 km, travelling 160 km by bus, and the rest by car. If the car averages 10 km/h faster than the bus, and the entire journey is 5 h, what is the speed of the car? [Answer: 90 km/h]
3. The sport biathlon combines cross-country skiing with rifle shooting. At the Olympics, competitors start at singly at one-minute intervals. Frank, who will start immediately after Anatole, feels that no matter how fast Anatole is, he can ski an average of 1 km/h faster. What is the average speed of each biathlete when they ski, if Frank overtakes Anatole at the first shooting range, which is 4 km from the start? [Answer: Anatole 15 km/h and Frank 16 km/h]
4. Students sent flowers costing \$20 to a sick classmate. There were four fewer students contributing than was planned, requiring each of the others to give 25 cents more. How many students contributed to the gift? [Answer: 16]
5. Brendan buys a block of shares of the company *HuskyTech* for \$1875. When the share price increases by \$4 per share, he sells all but 15 of them for \$1740. How many shares did he buy? [Answer: 75]



2) bus $\rightarrow 160 \text{ km}$
 $x \text{ km/h}$

car $\rightarrow 270 \text{ km}$
 $x+10 \text{ km/h}$

Total time = 5h

$$\frac{160}{x} + \frac{270}{x+10} = 5$$

3) A: distance 4 km
 speed $x \text{ km/h}$
 time: $\frac{4}{x}$

F: distance 4 km
 speed $x+1 \text{ km/h}$
 time $\frac{4}{x+1}$

$$\frac{4}{x} - \frac{4}{x+1} = \frac{1}{60}$$

$$\frac{4}{x} - \frac{4}{x+1} - \frac{1}{60} = 0$$

$$\frac{60(x+1)(4) - 60x(4) - x(x+1)}{60x(x+1)} = 0 \quad \begin{matrix} x \neq 0 \\ x \neq -1 \end{matrix}$$

$$\frac{240x + 240 - 240x - x^2 - x}{60(x)(x+1)} = 0$$

$$\frac{-x^2 - x + 240}{60(x)(x+1)} = 0$$

$$\frac{x^2 + x - 240}{60(x)(x+1)} = 0$$

$$\frac{(x+16)(x-15)}{60(x)(x+1)} = 0$$

$\therefore x = -16$ or 15
 \uparrow
 invalid

\therefore Anatole skis at 15 km/h
 and Frank skis at 16 km/h

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$$\begin{array}{l} \text{original} \\ \text{price} \\ \text{per} \\ \text{share} \end{array} \quad \frac{1875}{n}$$

$$\begin{array}{l} \text{new} \\ \text{price} \end{array} \quad \frac{1740}{n-15}$$

$$\frac{1740}{n-15} - \frac{1875}{n} = 4$$

$$\frac{1740}{n-15} - \frac{1875}{n} - 4 = 0$$

$$\frac{1740n - 1875(n-15) - 4(n)(n-15)}{n(n-15)} = 0$$

$$\frac{1740n - 1875n + 28125 - 4n^2 + 60n}{n(n-15)} = 0$$

$$\frac{-4n^2 - 75n + 28125}{n(n-15)} = 0$$

$$\frac{4n^2 + 75n - 28125}{n(n-15)} = 0$$

∴ original # of shares was 75

$$n = \frac{-75 \pm \sqrt{75^2 - 4(4)(-28125)}}{2(4)}$$

$$= \frac{-75 \pm \sqrt{455625}}{8}$$

$$= \frac{-75 \pm 675}{8}$$

$n = 75$ or \ominus
 ↑
 NOT VALID