Solve Zeros Domain

$x \in \mathbb{R}$, but $x \neq 3, -3$

$$f(x) = \frac{2x^2+5x-3}{x^2-9} = \frac{(2x-1)(x+3)}{(x+3)(x-3)} = \frac{2x-1}{x-3}$$

zeros

Zeros: $x = \frac{1}{2}$

a) $\frac{15x}{1}\cdot\frac{4}{2x} - \frac{15x}{1}\cdot\frac{x+1}{x} = \frac{2}{5}\cdot\frac{15x}{1}$

1) $x \neq 0$

2) wipe out fractions

$\frac{LCD}{1}$

$20 - 15(x+1) > 6x$

$20 - 15x - 15 = 6x$

$5 = 21x$

$\frac{5}{21} = x$

e) $\frac{1}{x+4} + \frac{3}{x+5} = \frac{1}{x^2+9x+20}$

1) $x \neq -4, -5$

2) LCD $= (x+5)(x+4)$

$x+5 + 3(x+4) = 1$

$x+5+3x+12 = 1$

$4x + 17 = 1$

$4x = -16$

$x \neq -4$

$\emptyset$

no solution

(b)

(d)

(*) $g(x) = \dfrac{6x^2 - 5x - 6}{4x^2 - 4x - 15} = \dfrac{(3x+2)(2x-3)}{(2x+3)(2x-5)}$ $\begin{matrix}-5\\+4\end{matrix}$ $\begin{matrix}-10\\+6\end{matrix}$

Zeros: $x = -\frac{2}{3}, x = \frac{3}{2}$

Domain: $x \neq -\frac{3}{2}, x \neq \frac{5}{2}$

$\frac{0}{5} = 0$

$\frac{5}{0} =$ und.

b) $\frac{x-1}{x} = \frac{3}{4} - \frac{3}{2x}$

$x = -2$

$$\left(\frac{2(y+1)(y-1)}{1}\right)\frac{1}{y-1} = \frac{2}{(y+1)(y-1)} - \frac{2(y+1)(y-1)}{1}\cdot\frac{1}{2}$$

1) $x \neq 1, -1$

2) LCD $= 2(y+1)(y-1)$

$$2(y+1) = 4 - (y^2 - 1)$$

$$2y + 2 = 4 - y^2 + 1$$

$$y^2 + 2y - 3 = 0$$

$$(y+3)(y-1) = 0$$

$y = -3, 1$

$r \cdot t = d$ $\quad r = \frac{d}{t}$ $\quad t = \frac{d}{r}$

23. **Plane Speed** A plane can fly 500 miles against the wind in the same amount of time that it can fly 725 miles with the wind. If the wind speed is 45 mph, find the speed of the plane in still air.

$t = \frac{d}{r}$ — same

wind = 45

p = plane

	rate	time	distance
against wind	$p - 45$	$\frac{500}{p-45}$	500
w/ wind	$p + 45$	$\frac{725}{p+45}$	725

$$\frac{(p-45)(p+45)}{1} \cdot \frac{500}{p-45} = \frac{725}{p+45} \cdot \frac{(p-45)(p+45)}{1}$$

$$500(p+45) = 725(p-45)$$

$$500p + 22500 = 725p - 32625$$

$$55125 = 225p$$

$$245 = p$$

plane 245 mph

ing sidewalk? Round your answer to the nearest tenth.

29. **Staining a Deck** It takes Shawn 2 more hours to stain a deck than Michelle. Together it takes them 2.4 hours to complete the work. How long would it take Shawn to stain the deck by himself?

Shawn = t+2 = 6
Michelle = t = 4

6 hrs

ind.	rate ·	tog time	= Part job
Shawn	$\frac{1}{t+2}$	2.4	$\frac{2.4}{t+2}$
michelle	$\frac{1}{t}$	2.4	$\frac{2.4}{t}$

LCD = t(t+2)

$$\frac{t(t+2)}{1}\cdot\frac{2.4}{t+2} + \frac{t(t+2)}{1}\cdot\frac{2.4}{t} = 1\cdot\frac{t(t+2)}{1}$$

$$2.4t + 2.4t + 4.8 = t^2 + 2t$$

$$0 = t^2 - 2.8t - 4.8$$

$$0 = (t-4)(t+1.2)$$

$$t = 4 \text{ or } t \neq -1.2$$

-4.8, +2, -2.8

6 · 8, 4 · 12, 24 · 2, 3 · 16