§6.6 More Stuff

#32 Plane & truck leave @ same time. Arrive at the same place, 450 miles away, 6 hours apart. The plane is 3 times faster than the truck.

Find speed of the truck.

Let x = the speed of the truck (in mph)

$D = rt$

$t = \dfrac{D}{r}$

	Truck	Plane
D	450 mi	450 mi
r	x	$3x$
t	$t = \dfrac{450}{x}$	$\dfrac{450}{3x} = t - 6$

Equation:

$$\frac{450}{x} - 6 = \frac{450}{3x}$$

Solve

LCD = $3x$

$$\left(\frac{450}{x}\right)(3x) - 6(3x) = \left(\frac{450}{3x}\right)(3x)$$

$$1350 - 18x = 450$$

$$-18x = -900$$

$$x = \frac{900}{18} = \frac{100}{2} = \boxed{50 \text{ mph}}$$

$$\frac{450}{x} \cdot \frac{3x}{1} - (6)(3x) = \frac{450}{3x} \cdot \frac{3x}{1}$$

How we've been clearing fractions.

(34) Speed in still water is 24 mph.
Boat travels 54 mi. upstream in same
time it takes to travel 90 mi. downstream.

Find speed of current.

Let x = speed of current (in mph)

	with	against
D	90 mi.	54 mi.
r	$x+24$	$24-x$
t	$\dfrac{90}{x+24}$	$\dfrac{54}{24-x}$

$$\frac{90}{x+24} =$$

LCD = $(x+24)(x-24)$

Beatriz

$$\left(\frac{90}{x+24}\right)(x+24)(x-24) = \left(\frac{54}{24-x}\right)(x+24)(x-24)$$
$$-1$$

$$90(x-24) = -54(x+24)$$

$$90x - 2160 = -54x - 1296$$
$$+54x + 2160 = +54x + 2160$$

$$144x = 864$$

$$x = \frac{864}{144} = \boxed{6 \text{ mph}} = x$$

$$\frac{2}{60} + \frac{3}{48}$$

$$\begin{array}{c|c} 2 & 60 \\ 2 & 30 \\ 3 & 15 \\ & 5 \end{array} \qquad \begin{array}{c|c} 2 & 48 \\ 2 & 24 \\ 2 & 12 \\ 2 & 6 \\ & 3 \end{array}$$

$$\frac{2}{2 \cdot 2 \cdot 3 \cdot 5} \cdot \frac{2 \cdot 2}{2 \cdot 2} + \frac{3}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} \cdot \frac{5}{5}$$

$$LCD = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$$

$$\frac{2 \cdot 2 \cdot 2 + 3 \cdot 5}{LCD} = \frac{8 + 15}{LCD} = \frac{23}{LCD} = \frac{23}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5}$$

$$\frac{x^2-23}{2x^2\ 5x-3} + \frac{2}{x-3} = \frac{-1}{2x+1}$$

① Find LCD.

② Put everything over LCD.

③ Equate Numerators.

① $(2x+1)(x-3) = LCD$

$$\frac{x^2-23}{(2x+1)(x-3)} + \left(\frac{2}{x-3}\right)\left(\frac{2x+1}{2x+1}\right) = \left(\frac{-1}{2x+1}\right)\left(\frac{x-3}{x-3}\right)$$

④ Solve.

② $$\frac{x^2-23+2(2x+1)}{LCD} = \frac{-1\,(x-3)}{LCD}$$

$$x^2-23+4x+2 = -x+3$$

$$\frac{12}{3x^2+12x} = 1 - \frac{1}{x+4}$$

$3x(x+4)$

$3x^2 = 3 \cdot x \cdot x$

$12x = 2 \cdot 2 \cdot 3 \cdot x$

$GCF = 3x$

$LCD = 3x(x+4)$

$$\frac{12}{3x(x+4)} = 1 \cdot \frac{3x(x+4)}{3x(x+4)} - \left(\frac{1}{x+4}\right)\left(\frac{3x}{3x}\right)$$

$$\frac{12}{LCD} = \frac{3x^2+12x}{LCD} - \frac{3x}{LCD} \quad , \text{ So } \dots$$

$$12 = 3x^2 + 12x - 3x$$

$$3x^2 + 9x - 12 = 0$$

$$3(x^2 + 3x - 4) = 0$$

$$3(x+4)(x-1) = 0$$

6.6 Due Monday

Test Wednesday