

Using Rat. Eqs. to Solve Context Problems w/ #1

① $\frac{x}{50} + \frac{x}{60} = 1$ ⁽⁵⁾⁽⁶⁾⁽¹⁰⁾
5 · 10 6 · 10 LCD: 5(6)(10) $\frac{1 \text{ job}}{50 \text{ hrs}} \cdot \frac{x \text{ hrs}}{1} + \frac{1 \text{ job}}{60 \text{ hrs}} \cdot \frac{x \text{ hrs}}{1} = 1$ (total job)

$$6x + 5x = 300$$

$$11x = 300$$

$$x = 27 \frac{3}{11} \text{ hours}$$

② $\frac{x}{90} + \frac{x}{180} = 1$

$$2x + x = 180$$

$$3x = 180$$

$$x = 60 \text{ minutes}$$

③ $\frac{x}{16} + \frac{x}{12} + \frac{x}{14} = 1$ LCM: 2 · 2 · 2 · 3 · 7 = 336

$$21x + 28x + 24x = 336$$

$$73x = 336$$

$$x = 4 \frac{44}{73} \text{ hours}$$

$\frac{1 \text{ job}}{4 \text{ hr}} \cdot 2 \text{ hrs} + \dots$ etc.

④ $\frac{2}{4} + \frac{2}{x} = 1$

$$2x + 8 = 4x$$

$$8 = 2x$$

$$x = 4 \text{ hours}$$

⑤ $\frac{x}{180} + \frac{x}{240} = 1$
doubling → 3 · 60 4 · 60

$$4x + 3x = 720$$

$$7x = 720$$

$$x = 102 \frac{6}{7} \text{ minutes}$$

⑥ $\frac{1}{25+r} + \frac{1}{25-r} = \frac{1}{10}$

$$10(25+r) + 10(25-r) = (25+r)(25-r)$$

$$250 + 10r + 250 - 10r = 625 - r^2$$

$$r^2 - 125 = 0 \quad r = \sqrt{125} \text{ (neg makes no sense)}$$

$$r^2 = 125 \quad r \approx 11.18 \text{ kph}$$

⑦ $\frac{5}{1.25x} + \frac{5}{x} = 1$

$$5 + 5(1.25) = 1.25x$$

$$11.25 = 1.25x$$

$$x = 0.9 \text{ mph}$$

⑧ $\frac{4}{10-x} + \frac{4}{10+x} = \frac{5}{6}$

$$4(6)(10+x) + 4(6)(10-x) = 5(10-x)(10+x)$$

$$240 + 24x + 240 - 24x = 500 - 5x^2$$

$$5x^2 = 20$$

$$x^2 = 4$$

$$x = 2 \text{ mph}$$