

To solve equations with fractional exponents:

- 1) Find the LCD.
- 2) Multiply both sides of the equation by the LCD
(when this is done, you should have an equivalent equation without any fractions).
- 3) Solve the equation.
- 4) Check your answer.

Ex 1) Solve: $\frac{x^2}{2} = \frac{2x}{15} + \frac{1}{10}$

LCD = 30

$$30 \left(\frac{x^2}{2} \right) = 30 \left(\frac{2x}{15} + \frac{1}{10} \right)$$

$$15x^2 = 4x + 3$$

$$15x^2 - 4x - 3 = 0$$

$$(3x + 1)(5x - 3) = 0$$

$$3x + 1 = 0 \text{ or } 5x - 3 = 0$$

$$3x = -1 \qquad 5x = 3$$

$$x = -\frac{1}{3} \text{ or } x = \frac{3}{5}$$

Ex 2) Solve: $\frac{x}{8} - \frac{x-2}{3} \geq \frac{x+1}{6} - 1$

LCD = 24

$$24 \left(\frac{x}{8} - \frac{x-2}{3} \right) \geq 24 \left(\frac{x+1}{6} - 1 \right)$$

$$3x - 8(x-2) \geq 4(x+1) - 24$$

$$3x - 8x + 16 \geq 4x + 4 - 24$$

$$-5x + 16 \geq 4x - 20$$

$$-9x \geq -36$$

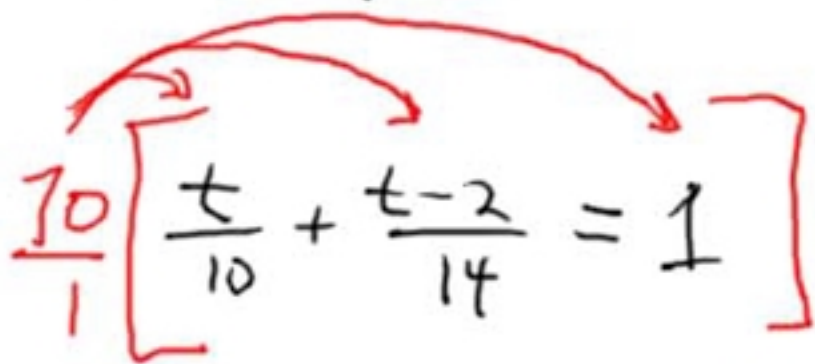
$$\frac{-9x}{-9} \leq \frac{-36}{-9}$$

$$x \leq 4$$

Ex 3) Machine A can complete a job in 10 hours. Machine B can complete the same job in 14 hours. Machine A started working on the job at 10:00 a.m. and machine B joined machine A at 12:00 noon working together on the same task. How long did it take to finish the job?

	Work	= Rate	x	Time
Machine A	$\frac{t}{10}$	$\frac{1}{10}$		t
Machine B	$\frac{t-2}{14}$	$\frac{1}{14}$		$t-2$

$$\frac{t}{10} + \frac{t-2}{14} = 1$$


$$\frac{70}{1} \left[\frac{t}{10} + \frac{t-2}{14} = 1 \right]$$

$$7t + 5(t-2) = 70$$

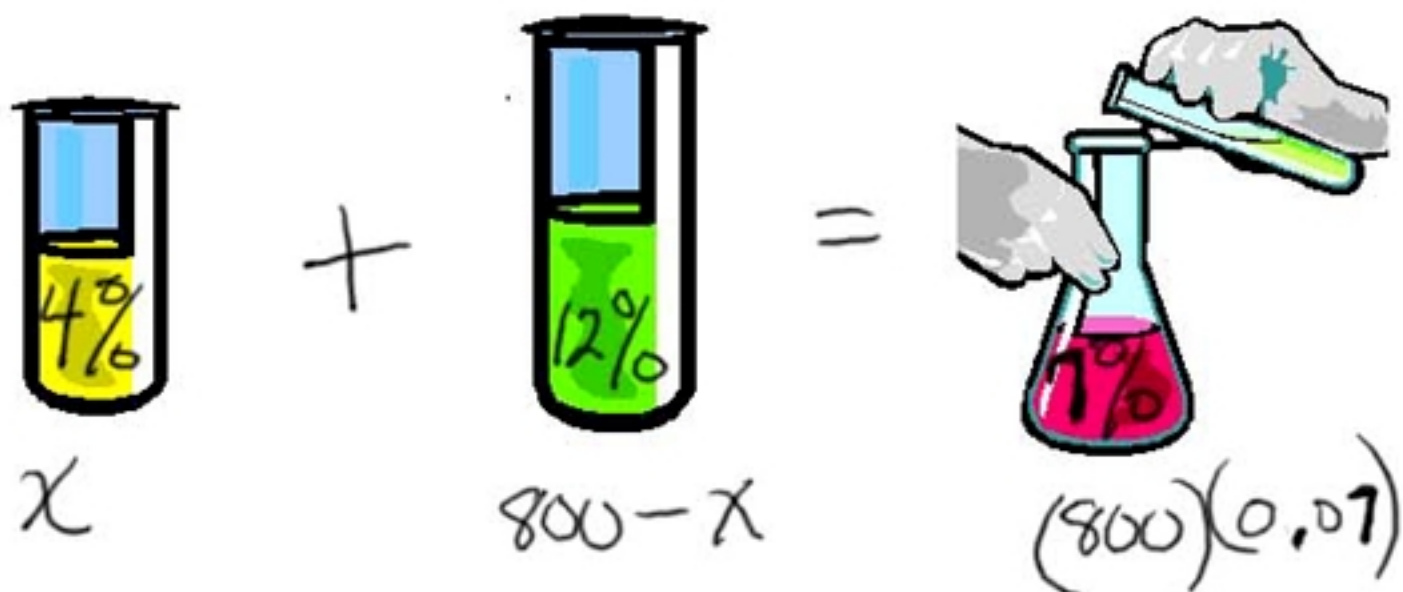
$$7t + 5t - 10 = 70$$

$$12t = 80$$

$$t = 6 \frac{2}{3} \text{ hours}$$

Ex 4) A nurse wishes to obtain 800 mL of a 7% solution of boric acid by mixing 4% and 12% solutions together. How much of each solution should be used?

	<u>Amount</u> <u>mL of Solution</u> x	<u>% of</u> <u>Boric Acid</u> =	<u>Amount</u> <u>mL of</u> <u>Boric Acid</u>
4% Solution	x	0.04	0.04x
12% Solution	800 - x	0.12	0.12(800 - x)
Final Mixture (7%) Solution	800	0.07	(.07)(800)



$$0.04x + 0.12(800 - x) = (0.07)(800)$$

Multiply by 100

$$4x + 12(800 - x) = 7(800)$$

$$4x + 9600 - 12x = 5600$$

$$-8x + 9600 = 5600$$

$$-8x = -4000$$

$$x = 500 \text{ mL} \\ 4\% \text{ solution}$$

$$800 - x = 300 \text{ mL} \\ 12\% \text{ solution}$$