W.U: Solve each equation (no calculator!) ⇒ use equivalent equations...

10-26 a) $32(3x) - 32(5) = 32(7)$

b) $9000x^2 - 6000x - 15000 = 0$

c) $\frac{1}{3} + \frac{x}{3} = \frac{10}{3}$

d) $2x^2 + 4x - 2.5 = 0$

a) $\frac{32(3x)}{32} - \frac{32(5)}{32} = \frac{32(7)}{32}$

$3x - 5 = 7$

$+5 \quad +5$

$3x = 12$

$\boxed{x = 4}$

b) $\frac{9000x^2}{3000} - \frac{6000x}{3000} - \frac{15000}{3000} = \frac{0}{3000}$

$3x^2 - 2x - 5 = 0$

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

$3x - 5 = 0 \quad x + 1 = 0$

$\boxed{x = 5/3 \quad x = -1}$

c) $\left(\frac{1}{3} \cdot 3 + \frac{x}{3} \cdot 3 = \frac{10}{3} \cdot 3\right)$

$1 + x = 10$

$\boxed{x = 9}$

d) $2x^2 + 4x - 2.5 = 0$

$\times 10 \quad \times 10 \quad \times 10 \quad \times 10$

$20x^2 + 40x - 25 = 0$

$\div 5 \quad \div 5 \quad \div 5 \quad \div 5$

$4x^2 + 8x - 5 = 0$

$(2x - 1)(2x + 5)$

$2x - 1 = 0 \quad 2x + 5 = 0$

$\boxed{x = \frac{1}{2} \quad x = \frac{-5}{2}}$

Fractions can be eliminated from an equation by multiplying BOTH sides (and all terms) of an equation by the common denominator. If you cannot determine a common denominator, then multiply the entire equation by the product of all of the denominators. We call the term used to eliminate the denominators a **fraction buster**. Also remember to check your answers. See the Math Notes boxes on pages 416 and 418.

Ex 1] Solve: $\frac{x}{2}+\frac{x}{6}=7$

Multiply both sides of the equation by 6, the common denominator, to remove the fractions.

$$6\cdot\left(\tfrac{x}{2}+\tfrac{x}{6}\right)=6(7)$$

Distribute and solve as usual.

$$6\cdot\frac{x}{2}+6\cdot\frac{x}{6}=6\cdot 7$$

$$3x+x=42$$

$$4x=42$$

$$x=\tfrac{42}{4}=\tfrac{21}{2}=10.5$$

Ex 2] Solve: $\frac{5}{2x}+\frac{1}{6}=8$

Multiply both sides of the equation by $6x$, the common denominator, to remove the fractions.

$$6x\cdot\left(\tfrac{5}{2x}+\tfrac{1}{6}\right)=6x(8)$$

Distribute and solve as usual.

$$6x\cdot\frac{5}{2x}+6x\cdot\frac{1}{6}=6x\cdot 8$$

$$15+x=48x$$

$$15=47x$$

$$x=\tfrac{15}{47}\approx 0.40$$

Ex 3] $\frac{x+3}{x-2} + 2 = \frac{x+5}{x-2}$

$\frac{(x+3)}{x-2}\cancel{(x-2)} + 2(x-2) = \frac{x+5}{x-2}\cancel{(x-2)}$

$x+3+2(x-2) = x+5$

$x+3+2x-4 = x+5$

$3x-1 = x+5$

$-x \quad +1 \quad -x \quad +1$

$2x = 6$

$\boxed{x = 3}$