

Review Problems

simplify.

$$1) 2(6-7x+5x^2) - 4(12-2x)$$

$$= \underline{12} - \underline{14x} + \underline{10x^2} - \underline{48} + \underline{8x}$$

$$= \boxed{10x^2 - 6x - 36}$$

Note:

Expressions get simplified.

Equations get solved.

2) Simplify.

$$\frac{3}{4}x^2 - \frac{2}{3}x + \frac{1}{5} - 1 - \frac{2}{3}x^2 + \frac{1}{4}$$

$$= \frac{3}{4}x^2 - \frac{2}{3}x^2 - \frac{2}{3}x + \frac{1}{5} - 1 + \frac{1}{4}$$

$$= \frac{3}{4}x^2 \left(\frac{3}{3}\right) - \frac{2}{3}x^2 \left(\frac{4}{4}\right) - \frac{2}{3}x + \frac{1}{5} \left(\frac{4}{4}\right) - 1 \left(\frac{20}{20}\right) + \frac{1}{4} \left(\frac{5}{5}\right)$$

$$= \frac{9}{12}x^2 - \frac{8}{12}x^2 - \frac{2}{3}x + \frac{4}{20} - \frac{20}{20} + \frac{5}{20}$$

$$= \frac{1}{12}x^2 - \frac{2}{3}x - \frac{16}{20} + \frac{5}{20}$$

$$= \boxed{\frac{1}{12}x^2 - \frac{2}{3}x - \frac{11}{20}}$$

Note: Same as

$$\boxed{\frac{x^2}{12} - \frac{2x}{3} - \frac{11}{20}}$$

Careful: Avoid diagonal fraction bars:

Note: $\frac{3}{4} \left(\frac{5}{7}\right) = \frac{15}{28}$

$$\frac{3}{4} \left(\frac{5}{7}\right) = \frac{15}{28}$$

Never write: $\frac{1}{12}x^2 - \frac{2}{3}x - \frac{11}{20}$

much clearer and less confusing!

Note: $\frac{3}{4}x$ what does this mean? Is x in the numerator or denominator?

$$\frac{3}{4}x = \frac{3}{4} \cdot \frac{x}{1} = \frac{3x}{4}$$

$\frac{3}{4}x$ looks like the writer meant $\frac{3}{4x}$

3) Solve

$$2x - 7 = 6 + 3x$$

$$2x = 6 + 7 + 3x$$

$$2x = 13 + 3x$$

$$2x - 3x = 13$$

$$\frac{-x}{-1} = \frac{13}{-1}$$

$$x = -13$$

Solution Set: $\{-13\}$

$$4) 6(1+3x) = 8(2x-1) + x$$

$$6 + 18x = 16x - 8 + x$$

$$6 + 18x = 17x - 8$$

$$6 + x = -8$$

$$x = -14$$

Solution Set:

$\{-14\}$

2.2: Multiplicative Property of Equality

Ex: What value of x solves $3x = 12$?

Solution: 4
(by inspection)

$$\text{check: } 3(4) = 12$$

$$12 = 12 \quad \checkmark_{\text{true}}$$

Sol'n Set: $\{4\}$

Multiplicative Property of Equality

If $a = b$, then $ac = bc$ (for $c \neq 0$)

In other words, we can multiply (or divide) both sides by the same nonzero number.

Ex: Solve. $3x = 12$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

Sol'n Set: $\{4\}$

Ex: Solve. $-5x + 3 = 17$

$$-5x = 17 - 3$$

$$-5x = 14$$

$$\frac{-5x}{-5} = \frac{14}{-5}$$

$$x = -\frac{14}{5} \quad \text{or} \quad x = -2\frac{4}{5}$$

Sol'n Set:

$$\left\{ -\frac{14}{5} \right\}$$

Ex: Solve.

$$\frac{2}{3}x = 7$$

$$\frac{\frac{2}{3}x}{\frac{2}{3}} = \frac{7}{\frac{2}{3}}$$

$$\cancel{\frac{2}{3}}x \left(\cancel{\frac{3}{2}} \right) = \frac{7}{1} \left(\frac{3}{2} \right)$$

$$x = \frac{21}{2}$$

Sol'n Set: $\left\{ \frac{21}{2} \right\}$

OR $\frac{2}{3}x = 7$

$$\left(\frac{3}{2} \right) \frac{2}{3}x = \frac{7}{1} \left(\frac{3}{2} \right)$$

$$\frac{6}{6}x = \frac{21}{2}$$

$$1x = \frac{21}{2}$$

$$\left\{ \frac{21}{2} \right\}$$