CHAPTER #8 Linear Equations

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recall

Algebraic Expressions vs **Algebraic Equations**

- phrase with no "=" sign
- can have different # of terms

- phrase with an "=" sign

Ex #1

a) $\frac{12x}{12} = \frac{-396}{12}$

$x = -33$

b) $\frac{r}{0.28} = \frac{-45}{1}$

$r = -1.26$

c) $-2\frac{1}{2}K = -3\frac{1}{2}$

$\frac{-5K}{2} = \frac{-7}{2}$

$\frac{-10K}{-10} = \frac{-14}{-10}$

$K = \frac{7}{5}$ or $1\frac{2}{5}$

d) $\frac{m}{3} = -\frac{2}{5}$

$\frac{5m}{5} = \frac{-6}{5}$

$m = \frac{-6}{5}$ or $-1\frac{1}{5}$

check your answers using SUBSTITUTION!!

Ex #2

a) $\frac{2x}{2} = \frac{10}{2}$

$x = 5$

$2(5) = 10$

$10 = 10$ ✓

b) $\frac{x}{4} = \frac{6}{8}$

$\frac{8x}{8} = \frac{24}{8}$

$x = 3$

$\frac{3}{4} = \frac{6}{8}$ ✓ Equivalent fractions!

4 8 ✓ fractions!

Ex #3

a) $\frac{1}{5}(x-15) = -4$

$\frac{1}{5}x - \frac{15}{5} = -4$

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

$+3 \quad +3$

$\frac{1}{5}x = -1$

$5 \quad 5$

$x = -5$

b) $\frac{t-1}{5} = \frac{3}{2}$

$\frac{t}{5} - \frac{1}{5} = \frac{3}{2} + \frac{1}{5}$

$+\frac{1}{5} \quad +\frac{1}{5}$

$\frac{t}{5} = \frac{15}{10} + \frac{2}{10}$

$\times 5 \quad \times 5$

$t = \frac{17}{10}$

$t = \frac{85}{10} = \frac{17}{2} = 8\frac{1}{2}$

$\left(\frac{t-1}{5}\right)^{\times 5} = \left(\frac{3}{2}\right)^{\times 5}$

$2 \times (t-1) = \left(\frac{15}{2}\right)^{\times 2}$

$2(t-1) = 15$

$2t - 2 = 15$

$+2 \quad +2$

$\frac{2t}{2} = \frac{17}{2}$

$t = \frac{17}{2}$ or $8\frac{1}{2}$

c) $\frac{x+1}{2} = \frac{3}{4}$

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

$-\frac{1}{2} \quad \frac{3}{4} - \frac{2}{4}$

$\frac{x}{2} = \frac{1}{4}$

$\frac{4x}{4} = \frac{2}{4}$

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

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

$2(x+1) = 3$

$2x + 2 = 3$

$-2 \quad -2$

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

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

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

Ex #4

a) $\left[\frac{1}{3}(2x-1)\right] \div 1 = \left[\frac{1}{2}(3x+1)\right] \times \frac{6}{1}$

$\frac{6}{3}(2x-1) \div \frac{6}{2}(3x+1)$

$2(2x-1) \div 3(3x+1)$

$4x - 2 \div 9x + 3$

$-9x + 2 \quad -9x + 2$

$\frac{-5x}{-5} \div \frac{5}{-5}$

$x \neq -1$

b) $\frac{x}{3}^{2} - \frac{3x}{2}^{3} = \frac{1}{6} - \frac{x}{1}^{\cdot 6}$

$\frac{2x}{6} - \frac{9x}{6} = \frac{1}{6} - \frac{6x}{6}$

$\frac{-7x}{6} = \frac{1}{6} - \frac{6x}{6}$

$+\frac{6x}{6} \qquad +\frac{6x}{6}$

$\frac{-1x}{6} = \frac{1}{6}$

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

$x = -1$

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