

Section 1.6: Simplifying Expressions

Note Title

8/21/2015

(Should be a Review)

Example: Simplify.

$$\begin{aligned} & 2(6-7x+5x^2) - 4(12-2x) \\ & = \underline{12} - \underline{14x} + 10x^2 - \underline{48} + \underline{8x} \\ & = \boxed{10x^2 - 6x - 36} \end{aligned}$$

Note:

Expressions get simplified.

Equations get solved.

An equation has an equals sign. An expression doesn't.

Like terms: have identical variables and exponents. Like terms can be combined by adding their coefficients. Unlike terms cannot be combined.

Example: Simplify.

$$\begin{aligned} & \frac{3}{4}x^2 - \frac{2}{3}x + \frac{1}{5} - 1 - \frac{2}{3}x^2 + \frac{1}{4} - 8x + \frac{1}{2}x \\ & = \frac{3}{4}x^2 - \frac{2}{3}x^2 - \frac{2}{3}x - 8x + \frac{1}{2}x + \frac{1}{5} - 1 + \frac{1}{4} \\ & = \frac{3}{4}x^2 \left(\frac{3}{3}\right) - \frac{2}{3}x^2 \left(\frac{4}{4}\right) - \frac{2}{3}x \left(\frac{2}{2}\right) - \frac{8}{1}x \left(\frac{6}{6}\right) + \frac{1}{2}x \left(\frac{3}{3}\right) + \frac{1}{5} \left(\frac{4}{4}\right) - \frac{1}{1} \left(\frac{20}{20}\right) + \frac{1}{4} \left(\frac{5}{5}\right) \\ & = \frac{9}{12}x^2 - \frac{8}{12}x^2 - \frac{4}{6}x - \frac{48}{6}x + \frac{3}{6}x + \frac{4}{20} - \frac{20}{20} + \frac{5}{20} \\ & = \boxed{\frac{1}{12}x^2 - \frac{49}{6}x - \frac{11}{20}} \end{aligned}$$

Note: This is equivalent to

$$\begin{aligned} & \frac{1}{12}x^2 - \frac{49}{6}x - \frac{11}{20} \\ & = \frac{1}{12} \cdot \frac{x^2}{1} - \frac{49}{6} \cdot \frac{x}{1} - \frac{11}{20} = \frac{x^2}{12} - \frac{49x}{6} - \frac{11}{20} \end{aligned}$$

$$\boxed{\frac{x^2}{12} - \frac{49x}{6} - \frac{11}{20}}$$

Caution: Never write $\frac{1}{12}x^2$. It's ambiguous!

If you want the x^2 on top (numerator), write $x^2/12$ or $\frac{x^2}{12}$
or $\frac{1}{12}x^2$

For x^2 in denominator, you would need to
write $\frac{1}{12x^2}$ or $\frac{1}{12x^2}$

Also, never write $\frac{1}{12}x^2$