

1.6: Simplifying Expressions

Note Title

8/24/2015

Example: Simplify.

$$\begin{aligned} & 2(6-7x+8x^2) - 3(7-5x) \\ &= \underline{12} - \underline{14x} + \underline{16x^2} - \underline{21} + \underline{15x} \\ &= 16x^2 + 1x - 9 \\ &= \boxed{16x^2 + x - 9} \end{aligned}$$

Also correct:

$$\begin{aligned} & x - 9 + 16x^2 \\ & -9 + 16x^2 + x \end{aligned}$$

Note:

Equation: Has an equals sign.

Expression: No equals sign.

Equations get solved.

Expressions get simplified.

Like terms: have identical variables and exponents.

Like terms can be combined by adding the coefficients.

Unlike terms cannot be combined.

Coefficient: the numerical part of each term.

So in $16x^2 + 5x^3 - 7x + 3$, the coefficient of x is -7 .

The coefficient of x^3 is 5 .

The constant is 3 .

Example: Simplify:

$$\frac{2}{3}x^2 - \frac{1}{4}x + \frac{1}{5} - \frac{1}{2}x^2 - 3 + \frac{3}{8}x - \frac{1}{3}x + \frac{3}{4}$$

Put like terms next to each other:

$$\frac{2}{3}x^2 - \frac{1}{2}x^2 - \frac{1}{4}x + \frac{3}{8}x - \frac{1}{3}x + \frac{1}{5} - \underline{3} + \frac{3}{4}$$

$$: \frac{2}{3}x^2 \left(\frac{2}{2}\right) - \frac{1}{2}x^2 \left(\frac{3}{3}\right)$$

$$- \frac{1}{4}x \left(\frac{6}{6}\right) + \frac{3}{8}x \left(\frac{3}{3}\right) - \frac{1}{3}x \left(\frac{8}{8}\right) + \frac{1}{5} \left(\frac{4}{4}\right) - \frac{3}{1} \left(\frac{20}{20}\right) + \frac{3}{4} \left(\frac{5}{5}\right)$$

$$: \frac{4}{6}x^2 - \frac{3}{6}x^2 - \frac{6}{24}x + \frac{9}{24}x - \frac{8}{24}x + \frac{4}{20} - \frac{60}{20} + \frac{15}{20}$$

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Prev. example cont'd:

$$= \frac{1}{6}x^2 - \frac{5}{24}x - \frac{41}{20}$$

Also
Correct:

$$\frac{x^2}{6} - \frac{5x}{24} - \frac{41}{20}$$

Careful: Don't write $\frac{1}{6}x^2$. It looks like the x^2 was maybe meant to be in the denominator.

Note

$$\frac{1}{6}x^2 = \frac{1}{6} \cdot \frac{x^2}{1} = \frac{x^2}{6}$$
$$\frac{5}{24}x = \frac{5}{24} \cdot \frac{x}{1} = \frac{5x}{24}$$

Also don't write $\frac{1}{6}x^2$