

Algebra 1

chapter

1

Section 1.4 Simplifying algebraic fractions

PROJECT MATHS
Text & Tests 6

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Example 1

Simplify (i) $\frac{5ax}{15a + 10a^2}$ (ii) $\frac{t^2 + 3t - 4}{t^2 - 16}$ (iii) $\frac{\frac{5}{8} + y}{\frac{1}{8}}$

(i) Are there common factors in numerator and denominator?

$$\begin{aligned} & \frac{5ax}{15a + 10a^2} \quad \text{HCF} \\ & = \frac{1\cancel{5}ax}{1\cancel{5}a(3+2a)} \\ & = \frac{x}{3+2a} \end{aligned}$$

(ii)

$$\begin{aligned} & \frac{t^2 + 3t - 4}{t^2 - 16} \quad \text{HCF} \\ & \quad \text{DOTS} \\ & = \frac{1(\cancel{t+4})(t-1)}{1(\cancel{t+4})(t-4)} \\ & = \frac{(t-1)}{(t-4)} \end{aligned}$$

Example 1

Simplify (i) $\frac{5ax}{15a + 10a^2}$ (ii) $\frac{t^2 + 3t - 4}{t^2 - 16}$ (iii) $\frac{\frac{5}{8} + y}{\frac{1}{8}}$

(iii) TRICK
x $\frac{8}{8}$

$$\begin{aligned} & \frac{\frac{5}{8} + y}{\frac{1}{8}} \\ &= \frac{8 \left(\frac{5}{8} + y \right)}{8 \left(\frac{1}{8} \right)} \\ &= \frac{5 + 8y}{1} \\ &= 5 + 8y \end{aligned}$$

Example 3

Simplify $\frac{y - \frac{x^2 + y^2}{y}}{\frac{1}{x} - \frac{1}{y}}$.

TRICK x $\left(\frac{xy}{xy} \right)$

$$\begin{aligned} & \frac{xy \left(y - \frac{x^2 + y^2}{y} \right)}{xy \left(\frac{1}{x} - \frac{1}{y} \right)} \\ &= \frac{y^2x - x^3 + y^2x}{y - x} \\ &= \frac{2y^2x - x^3}{y - x} \\ &= \frac{x(2y^2 - x^2)}{y - x} \end{aligned}$$

HCF