

Algebraic Fractions Lesson Practice

Simplifying Basic Algebraic Fractions

Express these fractions in their simplest form:

(a) $\frac{3}{6}$	(b) $\frac{8}{12}$	(c) $\frac{30}{16}$	(d) $\frac{54}{72}$
(e) $\frac{10a}{5}$	(f) $\frac{9b}{6}$	(g) $\frac{18}{12x}$	(h) $\frac{25}{15y}$
(i) $\frac{4c}{16c^2}$	(j) $\frac{32a}{8a^3}$	(k) $\frac{13p^2}{52p^3}$	(l) $\frac{36ab}{6bc}$
(m) $\frac{4a}{2a^2}$	(n) $\frac{10x^2}{12xy}$	(o) $\frac{3v^2t}{9vt^2}$	(p) $\frac{10ab^3}{2a^2b}$
(q) $\frac{30p^2q}{25pq^2}$	(r) $\frac{81x^2y^2}{6y^2}$	(s) $\frac{42mn^2}{56mn}$	(t) $\frac{8def^2}{10e^2f}$
(u) $\frac{3ab^2c}{4a^2c}$	(v) $\frac{4k^2m}{28km^2}$	(w) $\frac{5efg^2}{10e^2fg^3}$	(x) $\frac{21xy^2}{36x^3}$

Simplifying Algebraic Fractions by Factorising

Simplify by first finding the common factor:

(a) $\frac{3a + 6b}{6}$	(b) $\frac{4x + 12y}{2}$	(c) $\frac{3a + a^2}{ab}$	(d) $\frac{xy + y^2}{2y}$
(e) $\frac{xy + x^2}{6x + xy}$	(f) $\frac{3ab + 6b^2}{9b^2}$	(g) $\frac{25b^2 + 15b^3}{10b}$	(h) $\frac{14p + 10q}{2s}$
(i) $\frac{3a}{2ab - ac}$	(j) $\frac{6x}{9x + 9y}$	(k) $\frac{2st}{6rs - 2st}$	(l) $\frac{5c}{10ac + 15bc}$
(m) $\frac{14p + 28p^2}{8 + 16p}$	(n) $\frac{8c + 4d}{6ac + 3ad}$	(o) $\frac{8n^2 - 2n}{12n - 3}$	(p) $\frac{15x^2 + 6xy}{10x + 4y}$

Simplify the following by first factorising the numerator and/or denominator:

(a) $\frac{b^2 - 4}{b + 2}$	(b) $\frac{x^2 - 81}{x - 9}$	(c) $\frac{a^2 - 25}{a + 5}$	(d) $\frac{y^2 - 36}{y + 6}$
(e) $\frac{c^2 - 49}{2c - 14}$	(f) $\frac{a^2 - 64}{2a + 16}$	(g) $\frac{p^2 - 1}{5p - 5}$	(h) $\frac{q^2 - 9}{3q + 9}$
(i) $\frac{a^2 - b^2}{3a + 3b}$	(j) $\frac{x^2 - y^2}{5x - 5y}$	(k) $\frac{2m^2 - 18}{2m + 6}$	(l) $\frac{3d^2 - 48}{12d - 48}$
(m) $\frac{x^2 + 3x + 2}{x + 1}$	(n) $\frac{p - 1}{p^2 - 2p + 1}$	(o) $\frac{ax - 5a}{x^2 - 25}$	(p) $\frac{a^2 - 1}{a^2 + 2a + 1}$
(q) $\frac{b^2 + 6p - 9}{b^2 - 9}$	(r) $\frac{c^2 + 2c - 15}{c^2 - 25}$	(s) $\frac{3x^2 + 5x - 2}{x^2 - 4}$	
(t) $\frac{y^2 + 6y + 8}{y^2 + y - 12}$	(u) $\frac{p^2 - 4p - 5}{p^2 + 2p + 1}$	(v) $\frac{c^2 + 4c - 32}{c^2 + c - 56}$	
(w) $\frac{2x^2 + 13x + 6}{x^2 + 9x + 18}$	(x) $\frac{6a^2 - 13a - 5}{3a^2 - 11a - 4}$	(y) $\frac{10b^2 - 33b - 7}{10b^2 - 37b + 7}$	

Adding and Subtracting Algebraic Fractions

Express each sum as a fraction in its simplest form:

(a) $\frac{a}{5} + \frac{a}{5}$	(b) $\frac{2b}{5} + \frac{b}{10}$	(c) $\frac{3x}{4} + \frac{x}{8}$	(d) $\frac{p}{6} + \frac{2p}{3}$
(e) $\frac{y}{9} + \frac{2y}{3}$	(f) $\frac{3}{m} + \frac{2}{m}$	(g) $\frac{5}{x} + \frac{1}{x}$	(h) $\frac{2}{a} + \frac{5}{2a}$
(i) $\frac{4}{3y} + \frac{3}{y}$	(j) $\frac{8}{p} + \frac{3}{5p}$	(k) $\frac{3}{a} + \frac{2}{b}$	(l) $\frac{5}{x} + \frac{3}{y}$

Express each difference as a fraction in its simplest form:

(a) $\frac{3a}{5} - \frac{a}{5}$	(b) $\frac{2b}{5} - \frac{b}{10}$	(c) $\frac{3x}{4} - \frac{x}{8}$	(d) $\frac{5p}{6} - \frac{2p}{3}$
(e) $\frac{8y}{9} - \frac{2y}{3}$	(f) $\frac{5}{m} - \frac{2}{m}$	(g) $\frac{7}{x} - \frac{3}{x}$	(h) $\frac{5}{a} - \frac{1}{2a}$
(i) $\frac{8}{3y} - \frac{2}{y}$	(j) $\frac{8}{p} - \frac{3}{5p}$	(k) $\frac{3}{a} - \frac{2}{b}$	(l) $\frac{5}{x} - \frac{3}{y}$

Simplify the following:

(a) $\frac{x+2}{3} + \frac{x+3}{6}$

(b) $\frac{a+6}{4} + \frac{a-2}{3}$

(c) $\frac{d-3}{2} - \frac{d+2}{6}$

(d) $\frac{2a-1}{4} - \frac{a+2}{5}$

(e) $\frac{a+3b}{2} + \frac{a-2b}{4}$

(f) $\frac{2u+v}{3} - \frac{u-v}{4}$

(g) $\frac{2}{x+3} + \frac{3}{x+2}$

(h) $\frac{4}{x+5} + \frac{5}{x+1}$

(i) $\frac{7}{x-3} + \frac{4}{x+2}$

(j) $\frac{2}{x+4} - \frac{3}{x-3}$

(k) $\frac{1}{x-3} - \frac{5}{x-2}$

(l) $\frac{2}{x-5} - \frac{3}{x-4}$

Express as a single fraction in its simplest form

$$\frac{1}{x-2} + \frac{1}{x^2+x-6}$$

Multiplying and Dividing Algebraic Fractions

Express each product as a fraction in its simplest form

(a) $\frac{x}{3} \times \frac{x}{6}$

(b) $\frac{y}{2} \times \frac{y}{4}$

(c) $\frac{a}{2} \times \frac{b}{7}$

(d) $\frac{p}{3} \times \frac{q}{8}$

(e) $\frac{c^2}{5} \times \frac{c}{6}$

(f) $\frac{6}{a} \times \frac{2}{a}$

(g) $\frac{3}{x} \times \frac{10}{y}$

(h) $\frac{3}{p} \times \frac{4}{p}$

(i) $\frac{2}{3m} \times \frac{4}{5m}$

(j) $\frac{1}{b} \times \frac{11}{3c}$

(k) $\frac{5m}{6} \times \frac{3}{2m}$

(l) $\frac{5}{7x} \times \frac{4x}{3}$

(m) $\frac{2y}{9} \times \frac{12}{5y^2}$

(n) $\frac{2}{3a} \times \frac{3}{7a^2}$

(o) $\frac{5}{3p} \times \frac{2}{p^3}$

(p) $\frac{3t^2}{5s} \times \frac{2s^2}{6t^3}$

(q) $\frac{5pq}{2} \times \frac{3}{4pq^2}$

(r) $\frac{7ab^2}{6c} \times \frac{2c^3}{3a^2}$

(s) $\frac{4}{5mn} \times \frac{2m^4}{n^2}$

(t) $\frac{4yz}{9x} \times \frac{3xz}{2y^3}$

(u) $\frac{5ab^3}{3c} \times \frac{3a}{2bc^2}$

(v) $\frac{2cd}{7a} \times \frac{3a^2}{4cd^2}$

(w) $\frac{10xy^2}{3} \times \frac{12xy}{5y^2}$

(x) $\frac{3}{8s^3} \times \frac{4st}{t^3}$

(y) $\frac{4pq^2}{3a} \times \frac{6a^2}{5p^3}$

Express as a single fraction:

(a) $\frac{a}{4} \div \frac{a}{2}$

(b) $\frac{x}{2} \div \frac{y}{2}$

(c) $\frac{ab}{5} \div \frac{a}{2}$

(d) $\frac{p^2}{10} \div \frac{p}{5}$

(e) $\frac{2c}{3} \div \frac{c^2}{6}$

(f) $\frac{3}{t} \div \frac{6}{t}$

(g) $\frac{2}{k} \div \frac{4}{m}$

(h) $\frac{3}{y} \div \frac{9}{y^2}$

(i) $\frac{4}{bc} \div \frac{2}{c}$

(j) $\frac{3}{2x} \div \frac{12}{x^2}$

(k) $\frac{24xy}{35z} \div \frac{20xy}{21z}$

(l) $\frac{6q^2}{25p} \div \frac{9q}{20p^2}$

(m) $\frac{8ab}{21c} \div \frac{9b}{14ac}$

(n) $\frac{10m}{21n^2} \div \frac{8mn}{9}$

(o) $\frac{20ax}{33y} \div \frac{15x}{44ay^2}$