

Fractions and Algebraic Fractions

Recap algebra...

$3x \times x =$	$\frac{8x^2}{12x} =$	$2x^2(x + 3) =$	$(x + 2)(x + 3) =$	$(2x + 3)(x - 2) =$
-----------------	----------------------	-----------------	--------------------	---------------------

Cancelling down fractions...

$\frac{10}{40} =$	$\frac{27}{63} =$	$\frac{21}{7} =$	$\frac{5}{8} = \frac{?}{24}$	$\frac{24}{40} = \frac{?}{100}$
-------------------	-------------------	------------------	------------------------------	---------------------------------

Cancelling down algebraic fractions...

$\frac{10x^3}{35x^2} =$	$\frac{27x^2y^3}{18xy^4} =$	$\frac{3x^2-9x}{2x-6} =$	$\frac{x^2+5x+6}{x^2+7x+12} =$	$\frac{x^2-9}{x^2-x-6} =$
-------------------------	-----------------------------	--------------------------	--------------------------------	---------------------------

Multiplying fractions...

$\frac{1}{4} \times \frac{3}{5} =$	$\frac{2}{7} \times \frac{2}{9} =$	$\frac{2}{7} \times \frac{5}{6} =$	$\frac{3}{8} \times \frac{4}{9} =$	$\frac{12}{25} \times \frac{5}{24} =$
------------------------------------	------------------------------------	------------------------------------	------------------------------------	---------------------------------------

Multiplying algebraic fractions...

$\frac{x}{4} \times \frac{3x}{5} =$	$\frac{2x}{7} \times \frac{2}{x} =$	$\frac{2x^2}{7} \times \frac{x+1}{6} =$	$\frac{x-1}{8} \times \frac{4}{x+1} =$	$\frac{x+2}{x-2} \times \frac{x+3}{x+4} =$
-------------------------------------	-------------------------------------	---	--	--

Dividing fractions...

$\frac{1}{4} \div \frac{3}{5} =$	$\frac{2}{7} \div \frac{2}{9} =$	$\frac{2}{7} \div \frac{5}{21} =$	$\frac{3}{8} \div \frac{9}{16} =$	$\frac{12}{25} \div \frac{12}{35} =$
----------------------------------	----------------------------------	-----------------------------------	-----------------------------------	--------------------------------------

Dividing algebraic fractions...

$\frac{x}{4} \div \frac{3}{5x} =$	$\frac{2x}{7} \div \frac{2}{x} =$	$\frac{x+3}{7} \div \frac{5}{x+4} =$	$\frac{x-1}{8} \div \frac{x+1}{x+2} =$	$\frac{12}{x-1} \div \frac{x-1}{x+2} =$
-----------------------------------	-----------------------------------	--------------------------------------	--	---

Adding and subtracting fractions...

$\frac{7}{15} + \frac{8}{15} =$	$\frac{2}{7} + \frac{1}{21} =$	$\frac{7}{8} - \frac{1}{6} =$	$\frac{3}{8} + \frac{8}{9} =$	$\frac{5}{7} - \frac{2}{9} =$
---------------------------------	--------------------------------	-------------------------------	-------------------------------	-------------------------------

Adding and subtracting algebraic fractions...

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

Fractions and Algebraic Fractions - Answers

Recap algebra...

$3x \times x = 3x^2$	$\frac{8x^2}{12x} = \frac{2}{3x}$	$2x^2(x+3) = 2x^3 + (x+2)(x+3) = x^2(2x+3)(x-2) =$
----------------------	-----------------------------------	--

Cancelling down fractions...

$\frac{10}{40} = \frac{1}{4}$	$\frac{27}{63} = \frac{3}{7}$	$\frac{21}{7} = 3$	$\frac{5}{8} = \frac{15}{24}$	$\frac{24}{40} = \frac{60}{100}$
-------------------------------	-------------------------------	--------------------	-------------------------------	----------------------------------

Cancelling down algebraic fractions...

$\frac{10x^3}{35x^2} = \frac{2x}{7}$	$\frac{27x^2y^3}{18xy^4} = \frac{3x}{2y}$	$\frac{3x^2-9x}{2x-6} = \frac{3-x}{2}$	$\frac{x^2+5x+6}{x^2+7x+12} = \frac{x+2}{x+4}$	$\frac{x^2-9}{x^2-x-6} = \frac{x+3}{x+2}$
--------------------------------------	---	--	--	---

Multiplying fractions...

$\frac{1}{4} \times \frac{3}{5} = \frac{3}{20}$	$\frac{2}{7} \times \frac{2}{9} = \frac{4}{63}$	$\frac{2}{7} \times \frac{5}{6} = \frac{10}{42} = \frac{5}{21}$	$\frac{3}{8} \times \frac{4}{9} = \frac{12}{72} = \frac{1}{6}$	$\frac{12}{25} \times \frac{5}{24} = \frac{1}{10}$
---	---	---	--	--

Multiplying algebraic fractions...

$\frac{x}{4} \times \frac{3x}{5} = \frac{3x^2}{20}$	$\frac{2x}{7} \times \frac{2}{x} = \frac{4x}{7x} = \frac{4}{7}$	$\frac{2x^2}{7} \times \frac{x+1}{6} = \frac{2x^3+2x^2}{42}$	$\frac{x-1}{8} \times \frac{4}{x+1} = \frac{4(x-1)}{8(x+1)} = \frac{x-1}{2(x+1)}$	$\frac{x+2}{x-2} \times \frac{x+3}{2x+3} = \frac{x^2+5x+6}{2x^2+2x-6}$
---	---	--	---	--

Dividing fractions...

$\frac{1}{4} \div \frac{3}{5} = \frac{5}{12}$	$\frac{2}{7} \div \frac{2}{9} = \frac{9}{7} = 1\frac{2}{7}$	$\frac{2}{7} \div \frac{5}{21} = \frac{6}{5} = 1\frac{1}{5}$	$\frac{3}{8} \div \frac{9}{16} = \frac{2}{3}$	$\frac{12}{25} \div \frac{12}{35} = \frac{7}{5} = 1\frac{2}{5}$
---	---	--	---	---

Dividing algebraic fractions...

$\frac{x}{4} \div \frac{3}{5x} = \frac{5x^2}{12}$	$\frac{2x}{7} \div \frac{2}{x} = \frac{2x^2}{14} = \frac{x^2}{7}$	$\frac{x+3}{7} \div \frac{5}{x+4} = \frac{x^2+7x+12}{35}$	$\frac{x-1}{8} \div \frac{x+1}{x+2} = \frac{x^2+x-2}{8x+8}$	$\frac{12}{x-1} \div \frac{x-1}{x+2} = \frac{12x+24}{x^2-2x+1}$
---	---	---	---	---

Adding and subtracting fractions...

$\frac{7}{15} + \frac{8}{15} = \frac{15}{15} = 1$	$\frac{2}{7} + \frac{1}{21} = \frac{7}{21} = \frac{1}{3}$	$\frac{7}{8} - \frac{1}{6} = \frac{17}{24}$	$\frac{3}{8} + \frac{8}{9} = \frac{91}{72} = 1\frac{19}{72}$	$\frac{5}{7} - \frac{2}{9} = \frac{31}{63}$
---	---	---	--	---

Adding and subtracting algebraic fractions...

$\frac{5x+7}{(x-1)(x+3)}$	$\frac{3x-2}{(x-3)(x+4)}$	$\frac{x^2+6}{(x-3)(x+2)}$	$\frac{2x^2-5x-2}{x^2-4}$	$\frac{5x^2+3x+4}{(x-2)(x+4)}$
---------------------------	---------------------------	----------------------------	---------------------------	--------------------------------

Exam type questions

(These ones taken from [Justmaths](#))

- 1 Express as a single fraction.

$$\frac{m+1}{n+1} - \frac{m}{n}$$

- 2 Show that $\frac{2x+1}{3} + \frac{5x-2}{2}$ simplifies to $\frac{19x-4}{6}$
-

- 3 Show that $\frac{1}{6x^2+7x-5} \div \frac{1}{4x^2-1}$ simplifies to $\frac{ax+b}{cx+d}$
-

- 4 Show that $\frac{a}{b+1} - \frac{a}{(b+1)^2}$ can be written as $\frac{ab}{(b+1)^2}$
-

- 5 Show that $\frac{2x^2-3x-5}{x^2+6x+5}$ can be written in the form $\frac{ax+b}{cx+d}$
-

- 6 Show that
- $$\frac{4}{x-3} - \frac{2}{x+1} = \frac{2(x+5)}{(x-3)(x+1)}$$
-

- 7 Solve $\frac{x+2}{3x} + \frac{x-2}{2x} = 3$
-

- 8 Given that

$$2x - 1 : x - 4 = 16x + 1 : 2x - 1$$

find the possible values of x .