

Algebraic Fractions - Lesson 4

Dividing Algebraic Fractions

LI

- ÷ algebraic fractions.

SC

- ÷ numbers.
- Factorise quadratic expressions.

Example 1

Express as a single fraction in simplest form :

$$\begin{aligned} & b^4 \div \frac{3}{b} \\ = & \frac{b^4}{1} \times \frac{b}{3} \\ = & \frac{b^4 \times b^1}{1 \times 3} \\ = & \boxed{\frac{b^5}{3}} \end{aligned}$$

Example 2

Express as a single fraction in simplest form :

$$\frac{12}{M^2} \div \frac{7}{6M}$$

$$= \frac{12}{M^2} \times \frac{6M}{7}$$

$$= \frac{72M}{7M^2}$$

$$= \boxed{\frac{72}{7M}}$$

Example 3

Express as a single fraction in simplest form :

$$\begin{aligned} & \frac{2x}{9y^3} \div \frac{x^2}{3y} \times \frac{y}{12x} \\ = & \frac{2x}{9y^3} \times \frac{3y}{x^2} \times \frac{y}{12x} \\ = & \frac{6xy^2}{108x^3y^3} \\ = & \boxed{\frac{1}{18x^2y}} \end{aligned}$$

Example 4

Express as a single fraction in simplest form :

$$\begin{aligned} & \frac{x^2 - 36}{x^7} \div \frac{x + 6}{x^4} \\ = & \frac{x^2 - 36}{x^7} \times \frac{x^4}{x + 6} \\ = & \frac{(x - 6)(x + 6)}{x^7} \times \frac{x^4}{x + 6} \\ = & \frac{(x - 6)(x + 6)x^4}{(x + 6)x^7} \\ = & \boxed{\frac{x - 6}{x^3}} \end{aligned}$$

1 Express each of the following as a single fraction in its simplest form.			
a $3x^4 \div \frac{x^2}{5}$	b $x^3y \div \frac{3x^2}{y}$	c $\frac{4x^3}{7} \div 2x^2$	
d $\frac{2xy^2}{3} \div 6x^2y$	e $\frac{2x^2}{3} \div \frac{5x^3}{6}$	f $-\frac{2x^2y^3}{5} \div \frac{4x^3y^2}{5}$	
2 Express each of the following as a single fraction in its simplest form.			
a $\frac{3}{5x} \div \frac{6}{x^2} \times \frac{5}{4x}$	b $\frac{yz^2}{4x} \times \frac{x^2}{y} \div \frac{(xz)^2}{2}$	c $\frac{3x-3}{x+2} \div \frac{x^2-1}{x^2+4x+4}$	
d $\frac{x^3+7x^2+12x}{y^2-9} \div \frac{x^2+4x}{y-3}$	e $-\frac{b}{x^2+bx} \div \frac{b}{x+b}$	f $\frac{3x+3}{x^2+4x+4} \div \frac{3x^2+6x+3}{x^2-4}$	
3 Express each of the following as a single fraction in its simplest form.			
a $1 \div \frac{x}{y}$	b $\frac{1}{\frac{x}{x+1}}$	c $\frac{1}{\frac{1}{x-2}}$	d $\frac{\frac{a}{b}}{\frac{c}{d}}$

Answers

1	a	$15x^2$
	b	$\frac{xy^2}{3}$
	c	$\frac{2x}{7}$
	d	$\frac{y}{9x}$
	e	$\frac{4}{5x}$
	f	$-\frac{y}{2x}$

2	a	$\frac{1}{8}$
	b	$\frac{1}{2x}$
	c	$\frac{3(x+2)}{(x+1)}$
	d	$\frac{x+3}{y+3}$
	e	$-\frac{1}{x}$
	f	$\frac{x-2}{(x+1)(x+2)}$

3	a	$\frac{y}{x}$
	b	$\frac{x+1}{x}$
	c	$x - 2$
	d	$\frac{ad}{bc}$