Algebraic Fractions - Lesson 3

Multiplying Algebraic Fractions

<u>LI</u>

- x algebraic fractions.

<u>SC</u>

- x numbers.

- Factorise quadratic expressions.

Jan 10-12:11

Rules for $+, -, \times$ or $\div$ algebraic fractions are the same as those for numerical fractions

Oct 9-12:27

Example 1

Express as a single fraction in simplest form :

$$\frac{4}{p} \times \frac{3}{p}$$

$$= \frac{4 \times 3}{p \times p}$$

$$= \boxed{\frac{12}{p^2}}$$

Jun 8-12:56

<u>Example 2</u>

Express as a single fraction in simplest form :

$$\frac{7}{w} \times \frac{w^2}{6n} \qquad \qquad \frac{7}{w \div w} \times \frac{w^{2 \div w}}{6n}$$

$$= \frac{7 \times w^2}{w \times 6n} \qquad = \frac{7}{1} \times \frac{w}{6n}$$

$$= \frac{7w^2}{6nw} \qquad = \boxed{\frac{7w}{6n}}$$

$$= \boxed{\frac{7w}{6n}}$$

Jun 8-12:56

<u>Example 3</u>

Express as a single fraction in simplest form :

$$\frac{(x+1)(x-3)}{x+8} \times \frac{4(x+8)}{x-3}$$

$$= \frac{4(x+1)(x-3)(x+8)}{(x+8)(x-3)} \quad \div (x-3)\,(x+8)$$
$$\div (x-3)\,(x+8)$$

$$= \frac{4(x+1)}{1}$$

$$= \boxed{4(x+1)}$$

Jun 8-12:56

<u>Example 4</u>

Express as a single fraction in simplest form :

$$\frac{x + 7}{x^2 + 8x + 15} \times \frac{x^2 - 25}{x^2 - 2x - 63}$$

$$x^2 - 25 = (x - 5)(x + 5)$$

$$x^2 + 8x + 15 = (x + 5)(x + 3)$$

$$x^2 - 2x - 63 = (x + 7)(x - 9)$$

$$= \frac{x + 7}{(x + 5)(x + 3)} \times \frac{(x - 5)(x + 5)}{(x + 7)(x - 9)}$$

$$= \frac{(x + 7)(x - 5)(x + 5)}{(x + 5)(x + 3)(x + 7)(x - 9)}$$

$$= \frac{(x - 5)}{(x + 3)(x - 9)}$$

Jun 8-12:56

6

1 Express each of the following as a single fraction in its simplest form.

a $\dfrac{7}{x} \times \dfrac{2}{x}$

b $\dfrac{4}{x} \times \dfrac{x}{2y}$

c $\dfrac{5}{x} \times \dfrac{3}{10} \times \dfrac{xy}{3}$

d $\dfrac{2xy}{z} \times \dfrac{5}{4x^2}$

e $\dfrac{3}{2x^5} \times \dfrac{x^4}{9}$

f $\dfrac{(x+5)(x+2)}{x+3} \times \dfrac{2(x+3)}{x+2}$

2 Express each of the following as a single fraction in its simplest form.

a $\dfrac{5}{x} \times 2y$

b $x \times \dfrac{5x}{3}$

c $\dfrac{4x^2}{5} \times 3x^2$

d $(x+5) \times \dfrac{x-5}{3}$

e $\dfrac{5}{4x^2-4} \times (x+1)$

f $x+3 \times \dfrac{x^2+9}{x^2-9}$

g $\dfrac{3x}{x^2+3x-28} \times \dfrac{x^2-49}{x^2}$

h $\dfrac{x+3}{x^2+3x+2} \times \dfrac{x^2-4}{x^2+4x+3}$

i $\dfrac{x^2+x-12}{x^2-x-6} \times \dfrac{x^2-2x-8}{x^2-16}$

Answers

1 **a** $\dfrac{14}{x^2}$

b $\dfrac{2}{y}$

c $\dfrac{y}{2}$

d $\dfrac{5y}{2xz}$

e $\dfrac{1}{6x}$

f $2x + 10$

2 **a** $\dfrac{10y}{x}$

b $\dfrac{5x^2}{3}$

c $\dfrac{12x^4}{5}$

d $\dfrac{x^2-25}{3}$

e $\dfrac{5}{4(x-4)}$

f $\dfrac{x^2+9}{x-3}$

g $\dfrac{3x-21}{x^2-4x}$

h $\dfrac{x-2}{x^2+2x+1}$

i 1

Oct 9-12:57