Algebraic Fractions

1)

Mar

Express

$$\frac{2}{x-1} + \frac{4}{x+2} \qquad x \neq 1,\ x \neq -2$$

as a single fraction in its simplest form. **3**

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

$$= \frac{2(x+2)}{(x-1)(x+2)} + \frac{4(x-1)}{(x-1)(x+2)} \quad ✓ \ ✓$$

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

$$= \frac{6x}{(x-1)(x+2)} \quad ✓$$

Algebraic Fractions

2)

Express

$$\frac{s^2}{t} \times \frac{3t}{2s}$$

as a fraction in its simplest form. 2

$\frac{s^{\cancel{2}}}{\cancel{t}} \times \frac{3\cancel{t}}{2\cancel{s}}$ ✓ (dividing) or $\frac{s^2}{t} \times \frac{3t}{2s}$

$= \frac{3s}{2}$ ✓ (multiplying) $= \frac{3s^{\cancel{2}}\cancel{t}}{2\cancel{s}\cancel{t}}$ ✓ (multiplying)

$= \frac{3s}{2}$ ✓ (dividing)

Algebraic Fractions

3)

Simplify

$\frac{3x-15}{(x-5)^2}$. 2

$$\frac{3x-15}{(x-5)^2}$$

$$= \frac{3(x-5)}{(x-5)^2} \checkmark \quad \div (x-5)$$

$$\div (x-5)$$

$$= \frac{3}{x-5} \checkmark$$

Algebraic Fractions

4)

Express

$$\frac{3}{x} - \frac{4}{x+1}, \qquad x \neq 0, \quad x \neq -1$$

as a single fraction in its simplest form. **3**

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

$$= \frac{3(x+1)}{x(x+1)} - \frac{4x}{x(x+1)} \quad \checkmark \checkmark$$

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

$$= \frac{3-x}{x(x+1)} \quad \checkmark$$

Algebraic Fractions

5)

Marks

Express as a single fraction

$\frac{a}{b}+\frac{b}{a}, \quad a \neq 0, \quad b \neq 0.$ **2**

$$\frac{a}{b} + \frac{b}{a}$$

$$= \frac{a^2}{ab} + \frac{b^2}{ab} \checkmark$$

$$= \frac{a^2+b^2}{ab} \checkmark$$

Algebraic Fractions

6)

Simplify $\dfrac{(x+4)^2}{x^2-x-20}$. **3**

$$\frac{(x+4)^2}{x^2-x-20}$$

$$= \frac{(x+4)^2}{(x+4)(x-5)} \quad \div (x+4) \quad \checkmark \quad \checkmark \div (x+4)$$

$$= \frac{x+4}{x-5} \quad \checkmark$$

Algebraic Fractions

7)

Simplify $\frac{x^6}{y^2} \times \frac{y^3}{x^3}$. 2

$\frac{x^{\overset{3}{6}}}{\cancel{y^2}} \times \frac{\cancel{y^3}}{\cancel{x^3}}$ ✓ (dividing)

$= x^3 y$ ✓ (multiplying)

OR $\frac{x^6}{y^2} \times \frac{y^3}{x^3}$

$= \frac{x^{\overset{3}{6}} \cancel{y^3}}{\cancel{x^3}\cancel{y^2}}$ ✓ (multiplying)

$= x^3 y$ ✓ (dividing)

DO NOT LEAVE answer as $\frac{x^3 y}{1}$

Algebraic Fractions

8) Express

$$\frac{2}{(x-4)}+\frac{5}{x}, \qquad x \neq 0, \ x \neq 4,$$

as a single fraction in its simplest form.

$$\frac{2}{x-4} + \frac{5}{x}$$

$$= \frac{2x}{x(x-4)} + \frac{5(x-4)}{x(x-4)} \quad \checkmark \ \checkmark$$

$$= \frac{2x + 5x - 20}{x(x-4)}$$

$$= \frac{7x - 20}{x(x-4)} \quad \checkmark$$