

Year 2 Pure Chapter 1: Algebraic Fractions - Exam Questions (Answers)

1.

$$\frac{x^3 + 3x^2 + 2x}{(x^2 - 1)} \div \frac{(x+2)}{(x-1)}$$

$$\frac{x(x^2 + 3x + 2)}{(x-1)(x+1)} \div \frac{(x+2)}{(x-1)}$$

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

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

x

2. $2x^2 + 7x + 6 = (x + 2)(2x + 3)$

M1 A1

$$\frac{3x^2}{(2+x)(3+2x)} \times \frac{7(3+2x)}{3x^5}$$

$$= \frac{7}{(2+x)x^3}$$

$$3. \quad \frac{(x-3)(x-5)}{(x-3)(x+3)} \times \frac{2x(x+3)}{(x-5)^2} \quad (3 \times \text{factorising}) \quad \text{B1 B1 B1}$$

$$= \frac{2x}{x-5} \quad \text{B1}$$

$$4. \quad (a) \quad \frac{2}{x-3} + \frac{13}{(x-3)(x+7)} \quad \text{M1}$$

$$= \frac{2(x+7)+13}{(x-3)(x+7)} = \frac{2x+27}{(x-3)(x+7)} \quad \text{M1 A1}$$

$$(b) \quad 2x+27 = x^2 + 4x - 21 \quad \text{M1}$$

$$x^2 + 2x - 48 = (x+8)(x-6) = 0$$

$$x = -8, 6 \quad \text{M1 A1}$$

5. (a) $\frac{(x-3)(x+2)}{x(x-3)}; = \frac{(x+2)}{x}$ or $1 + \frac{2}{x}$ B1,B1,B1

(b) $\frac{(x+2)}{x} = x+1 \Rightarrow x^2 = 2$ M1 A1ft

$x = \pm\sqrt{2}$ A1

6. $\frac{x(2x+3)}{(2x+3)(x-2)} - \frac{6}{(x-2)(x+1)}$ B1, B1

$= \frac{x(x-1)-6}{(x-2)(x+1)}$ M1 A1ft

$= \frac{(x+3)(x-2)}{(x-2)(x+1)}$ M1 A1

$= \frac{x+3}{x+1}$ A1