QT Algebraic Fractions 1

1. Simplify fully $\frac{x^2+2x}{x^2+5x+6}$

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

(2 marks)

2. Simplify fully $\frac{x^2-16}{x^2-9x+20}$

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

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

(2 marks)

3. Simplify fully $\frac{x^2-2x-24}{x^2-4x-12}$

$$\frac{(x-6)(x+4)}{(x-6)(x+2)}$$

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

-24

$(\ \ )$

$-6 \quad +4$

-12

$(\ \ )$

$-6 \quad +2$

(2 marks)

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4. Simplify fully $\dfrac{x+5}{x^2-25}$

$$\frac{1(x+5)}{(x+5)(x-5)}$$

$$= \frac{1}{x-5}$$

(2 marks)

5. Write $\dfrac{2x^2+7x+6}{x^2+x-2}$ in the form $\dfrac{ax+b}{x+c}$ where $a,\ b$ and c are integers

12

4 3

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

-2

1

$2\ \ -1$

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

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

(3 marks)

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6. Write $\frac{2x^2+18x+28}{x^2-49}$ in the form $\frac{ax+b}{x+c}$ where $a,\ b$ and c are integers

56
1
14 4

$$\frac{2x^2+14x+4x+28}{(x+7)(x-7)}$$

$$\frac{2x(x+7)+4(x+7)}{(x+7)(x-7)}$$

$$\frac{(x+7)(2x+4)}{(x+7)(x-7)} = \frac{2x+4}{x-7}$$

(3 marks)

7. Simplify fully $\frac{2x+4}{x-2} \div \frac{2x^2+7x+6}{x^2-2x}$

$$\frac{2(x+2)}{x-2} \times \frac{x(x-2)}{2x^2+4x+3x+6}$$

$$\frac{2(x+2)}{x-2} \times \frac{x(x-2)}{2x(x+2)+3(x+2)}$$

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

(3 marks)

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8. Simplify fully $\frac{2x-12}{x-4} \div \frac{2x^2-6x-36}{x^2-9x+20}$

-72
$-12 \quad +6$

$\frac{2(x-6)}{x-4} \times \frac{(x-5)(x-4)}{2x^2-12x+6x-36}$

$\frac{2(x-6)}{x-4} \times \frac{(x-5)(x-4)}{2x(x-6)+6(x-6)}$

$\frac{2(x-6)}{x-4} \times \frac{(x-5)(x-4)}{(x-6)(2x+6)}$

$\frac{2(x-5)}{2x+6} = \frac{2(x-5)}{2(x+3)}$

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

(3 marks)