

1.8 Answers

GCSE Mathematics Algebraic Fractions

1.8.1

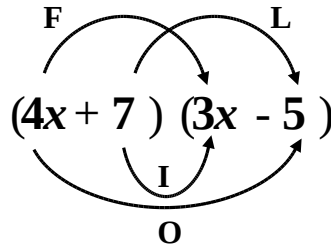
METHOD 1 (Multiplication Grid)

	$4x$	$+7$
$3x$	$12x^2$	$21x$
-5	$-20x$	-35

$$12x^2 + x - 35$$

[2 marks]

METHOD 2 (Foil)



$$12x^2 - 20x + 21x - 35$$

$$12x^2 + x - 35$$

[2 marks]

1.8.2 Factorisation

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

[2 marks]

(b) $x^2 - 49 = x^2 - 7^2$ a difference of two squares
 $= (x + 7)(x - 7)$

[1 mark]

1.8.3 An Algebraic Fraction

$$\begin{aligned}\frac{x^2 + 5x - 66}{x^2 + 2x - 48} &= \frac{(x + 11)(x - 6)}{(x + 8)(x - 6)} \\ &= \frac{x + 11}{x + 8}\end{aligned}$$

[3 marks]

1.8.4 Proof of “A difference of two squares”

$$\begin{aligned}\text{Clearly, } (x + y)(x - y) &= x^2 - xy + xy - y^2 && \text{using FOIL} \\ &= x^2 - y^2\end{aligned}$$

$$\therefore x^2 - y^2 = (x + y)(x - y) \quad \text{as claimed}$$

[3 marks]

1.8.5 Mental Arithmetic

$$\begin{aligned}47^2 - 43^2 &= (47 + 43)(47 - 43) \\ &= 90 \times 4 \\ &= 360\end{aligned}$$

[2 marks]

1.8.6 Solutions (1.6 Exercise)

Answer 1

(i) $x^2 - 3x - 18$

(ii) $x^2 - 6x - 40$

(iii) $x^2 + x - 20$

(iv) $x^2 - 5x - 24$

(v) $x^2 + 3x - 88$

(vi) $x^2 + 9x - 52$

[6 marks]

Answer 2

(i) $12x^2 - 19x - 21$

(ii) $20x^2 + 7x - 6$

(iii) $9x^2 + 43x + 28$

(iv) $15x^2 - 41x + 28$

(v) $169x^2 + 130x + 25$

(vi) $99x^2 - 94x + 16$

Answer 3

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

(ii) $\frac{x + 6}{x + 8}$

(iii) $\frac{x - 9}{x - 8}$

(iv) $\frac{x + 7}{x + 5}$

(v) $2x + 4$

Answer 4

(i) $2x + 4$

(ii) $\frac{x - 4}{x - 2}$

(iii) $\frac{x + 12}{x + 11}$

(iv) $2x + 24$

(v) $2x + 14$

Answer 5

(a) $(2x + 3)(x + 1)$

(b) $(2y - 3)(2y + 3)$

Answer 6

$$\frac{x}{x - 6}$$