

Algebraic Fractions

For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **32**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** Which of these is equal to $\frac{a}{3} + \frac{2}{b}$?
Circle your answer.

[1 mark]

$$\frac{a+2}{3+b}$$

$$\frac{ab+6}{3b}$$

$$\frac{a+2}{3b}$$

$$\frac{ab+2}{3b}$$

- 2** Write each expression as a single fraction in its simplest form.

(a) $\frac{7}{10x} - \frac{2}{15x}$

[2 marks]

Answer _____

(b) $\frac{5}{6x} - \frac{3}{4x^2}$

[2 marks]

Answer _____

3 Simplify fully $\frac{x^3 - 6x^2 + 9x}{x^2 - 9}$

[3 marks]

Answer _____

4 Simplify fully

(a) $\frac{6x^2 + 7x - 3}{4x^2 - 9}$

[3 marks]

Answer _____

(b) $\frac{10 - 2x}{x^2 - 3x - 10}$

[2 marks]

Answer _____

5 Simplify fully $\frac{12a^2b - 8ab^2}{9a^2 - 4b^2}$

[3 marks]

Answer _____

- 6** Write as a single fraction in its simplest form

$$\frac{4}{x-3} - \frac{3}{2x+1}$$

[3 marks]

Answer _____

- 7** Simplify fully $\frac{2x^2 + 5x - 3}{x^2 - 16} \div \frac{4x - 2}{x^2 + 4x}$

[4 marks]

Answer _____

- 8** Show that

$$\frac{x}{x-3} - \frac{5x+6}{x^2+x-12} = \frac{x+2}{x+4}$$

[4 marks]

- 9 A cyclist rides 12 km at a steady speed of x km/h.
She then rides a further 15 km at a steady speed of $(x + 3)$ km/h.
The total time for the whole journey is 2 hours.

(a) Show that $2x^2 - 21x - 36 = 0$

[3 marks]

- (b) Work out the cyclist's speed for the 15 km part of the journey.

[2 marks]

Answer _____ km/h