

**Mixed Exercise 3**

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1. Factorise completely,

(a)  $x^2 - 7x - 18$

(b)  $2x^2 + 8x$

(c)  $2x^2 + x - 10$

(d)  $3x^2 - 9x + 6$

(e)  $9x^2 - 25$

(f)  $2a^3 - 18a$

(g)  $3x(2a - b) - y(2a - b)$

(h)  $5a(x - 2y) + 2b(x - 2y)$

(i)  $(2a + b)(a^2 + 2) + (2a + b)(5a + 4)$

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2. Simplify the following expression:

$$5\sqrt{12} - 2\sqrt{75} + 3\sqrt{27}$$

3. Rationalise the denominators.

(a)  $\frac{2}{5-\sqrt{3}}$

(b)  $\frac{3}{2-4\sqrt{5}}$

(c)  $\frac{1}{2\sqrt{3}+1}$

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4. Solve the following equations, simplifying your answers.

(a)  $6(x - 3) = \sqrt{5}x - 4$

(b)  $\sqrt{3}(x - 2\sqrt{3}) = 2(3 - 5x)$

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5. Simplify,

(a)

$$\frac{14x + 20}{2x - 16}$$

(b)

$$\frac{x^2 + 10x + 9}{x + 1}$$

(c)

$$\frac{c + 8}{c^2 + 14c + 48}$$

(d)

$$\frac{y^2 + 4y + 3}{y^2 + 11y + 24}$$

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6.

Express as a single fraction

a)  $\frac{x+7}{4} + \frac{x-3}{5}$

b)  $\frac{x-5}{4} + \frac{x}{3}$

c)  $\frac{1}{2x} - \frac{1}{5x}$

d)  $\frac{8}{x-4} + \frac{7}{x}$

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

f)  $\frac{4}{x-1} + \frac{3}{x^2+6x-7}$

g)  $\frac{1}{x-4} - \frac{5}{x^2-x-12}$

h)  $\frac{4}{x+1} - \frac{2}{x^2+9x+8}$

i)  $\frac{1}{x-5} - \frac{7}{x^2+3x-40}$