1A Laws of Indices

1. Simplify

a) $x^2 \times x^5$

b) $2r^2 \times 3r^3$

c) $\frac{b^7}{b^4}$

d) $6x^5 \div 3x^3$

e) $(a^3)^2 \times 2a^2$

f) $(3x^2)^3 \div x^4$

2. Expand and simplify if possible

a) $-3x(7x - 4)$

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

c) $4x(3x - 2x^2 + 5x^3)$

d) $2x(5x + 3) - 5(2x + 3)$

3. Simplify

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

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

c) $\frac{20x^7+15x^3}{5x^2}$

1D Negative & Fractional Indices

1. Simplify

a) $\frac{x^3}{x^{-3}}$

b) $x^{\frac{1}{2}} \times x^{\frac{3}{2}}$

c) $(x^3)^{\frac{2}{3}}$

d) $\sqrt[3]{125x^6}$

e) $\frac{2x^2-x}{x^5}$

2. Evaluate (work out the value of)

a) $9^{\frac{1}{2}}$

b) $64^{\frac{1}{3}}$

c) $49^{\frac{3}{2}}$

d) $25^{-\frac{3}{2}}$

3. Given that $y = \frac{1}{16}x^2$, express $y^{\frac{1}{2}}$ in the form kx^n where k and n are constants

4. Given that $y = \frac{1}{16}x^2$, express $4y^{-1}$ in the form kx^n where k and n are constants

1E Surds Introduction

1. Simplify

a) $\sqrt{18}$

b) $\frac{\sqrt{20}}{2}$

c) $5\sqrt{6} - 2\sqrt{24} + \sqrt{294}$

2. Expand and simplify if possible

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

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

1F Rationalising Surds

1. Rationalise

a) $\frac{1}{\sqrt{3}}$

b) $\frac{1}{3+\sqrt{2}}$

c) $\frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$

d) $\frac{1}{(1-\sqrt{3})^2}$

1B Expanding Brackets

1. Expand

a) (x + 4)(x + 7)

b) (2x + 3)(x – 8)

c) $(x + 4)(2x - 1)(x + 3)$

1C Factorising

1. Factorise

a) 3x + 9

b) $x^2 - 5x$

c) $8x^2 + 20x$

d) $9x^2y + 15xy^2$

e) $3x^2 + 9xy$

2. Factorise

a) $x^2 + 6x + 8$

b) $x^2 - 4x - 5$

c) $x^2 - 25$

d) $4x^2 - 9y^2$

e) $5x^2 - 45$

3. Factorise

a) $2x^2 - 5x - 3$

b) $2x^2 + 13x + 11$

c) $3x^2 - 11x - 4$