

1. Simplify these expressions
 - a. $2as + 3sa - 7a^2 + 4a - 6as$
 - b. $2x^2y + 4yxy - (xy)^2 + 5xy$
 - c. $4b(a + b) - 2a(3a - 4b)$
 - d. $5m^2(3 - 1p) + 5m^2 - 10mp$

2. Simplify these expressions
 - a. $3x^2 \times 2x^{-5}$
 - b. $6r(r^2) \div 2r^4$
 - c. $(2a^3)^2 \div a^5$
 - d. $(3x)^3 \times (\frac{1}{3})x^{-5}$
 - e. $3b(a^3)^2 \times (ba)^2$
 - f. $12m^3p^{-5} \times (3^2pm)^{-2} \div (m(2p)^{-3})$

3. Expand and simplify
 - a. $2x(3x - 1) + x^2$
 - b. $-4x(5x - 3y + x^2)$
 - c. $-y(3xy - 5y^2) + 4x(3y - 2y^2 + 5x)$
 - d. $3m(5 - 2m)(3m - 1)$
 - e. $(x - 3)^2(4 - x)$
 - f. $-(2x - y)(2y - x)(x - 7)$

4. Factorise completely
 - a. $6g^2 - 3g$
 - b. $4a^2 - 2a + 5a - a$
 - c. $-35as - 7sa^2$
 - d. $-4s^3tv + 8s^2tv^2 - 12s^2tv$
 - e. $5x^3 + 2x^6 + 4x^2$
 - f. $a^9 - 8a^6$

5. Factorise in full
 - a. $y^2 + 8y + 12$
 - b. $s^2 - 3s - 10$
 - c. $2a^2 - 50$
 - d. $y^2 - 7y + 12$
 - e. $b^2 + 2b - 8$
 - f. $x^3 - 64x$

6. Factorise
 - a. $2a^2 + 5a - 3$
 - b. $6n^2 - 11n - 10$
 - c. $10x^2 + 11x - 6$
 - d. $3g^2 - 4g - 7$
 - e. $12m^2 - 23m + 10$
 - f. $6y^2 - 31y - 11$

7. Simplify
 - a. $3x^3 \div x^{-3/2}$
 - b. $(x^{1/2})^3 \times x^{-3/2}$
 - c. $(8a^6)^{2/3}$
 - d. $2x^{1/2} \div 4x^{1/4}$
 - e. $(3x)^2y^{-2} \times 6x^{-1/2} \div (2xy)^3$

8. Evaluate
 - a. $16^{1/2}$
 - b. $(-64)^{1/3}$
 - c. $27^{2/3}$
 - d. $9^{-3/2}$
 - e. $((-1/8)^{1/3})^4$
 - f. $(81/121)^{1/2}$

9. Simplify
 - a. $\sqrt{2} \times \sqrt{6}$
 - b. $\frac{\sqrt{250}}{\sqrt{2}}$
 - c. $3\sqrt{10} \times 2\sqrt{5}$
 - d. $-3\sqrt{20} \times \sqrt{10}$
 - e. $-3\sqrt{15} \times \sqrt{8} \times 2\sqrt{27}$
 - f. $2\sqrt{6} \times 3\sqrt{10} \times 2\sqrt{15}$

10. Simplify
 - a. $5\sqrt{6} - 2\sqrt{24} + \sqrt{294}$
 - b. $2\sqrt{27} - 5\sqrt{48} - 5\sqrt{12}$
 - c. $3\sqrt{112} + 5\sqrt{28} + 2\sqrt{63}$
 - d. $-5\sqrt{33} + 3\sqrt{132} - 3\sqrt{66}$
 - e. $5\sqrt{32} - 3\sqrt{50} - 3\sqrt{18}$
 - f. $-\sqrt{90} + 8\sqrt{10} + 2\sqrt{40}$

11. Rationalise the denominator of
 - a. $\frac{3}{-\sqrt{11}}$
 - b. $\frac{2}{\sqrt{3} + 1}$
 - c. $\frac{-\sqrt{3}}{\sqrt{5} - \sqrt{3}}$
 - d. $\frac{5\sqrt{2}}{2 - \sqrt{5}}$
 - e. $\frac{-3\sqrt{2}}{\sqrt{8} - \sqrt{32}}$
 - f. $\frac{-5\sqrt{5}}{\sqrt{50} - \sqrt{5}}$
 - g. $\frac{12}{\sqrt{27} - \sqrt{45}}$