

L2 Algebra Revision #5

1. Simplify: $\frac{1}{x+y} + \frac{2}{y}$
2. Expand and simplify: $(3x - 1)(5x + 3)(x - 8)$
3. Factorise fully: $10x^2 + 9x - 9$
4. Simplify fully: $\frac{3 + \frac{1}{x}}{(4x)^{-1}}$
5. Simplify fully: $\frac{x^2 + 7x + 12}{x^2 + 4x}$
6. If $\log_b(k) = 2$ and $\log_b(j) = 5$ what is $\log_b\left(\frac{j^2}{k}\right)$
7. Solve $4^x = 19$
8. Solve: $\frac{x^2 + 4x + 1}{x + 3} = 5$

Answers: L2 Algebra Revision #5

$$1. \quad \text{Simplify: } \frac{1}{x+y} + \frac{2}{y} = \frac{y}{(x+y)y} + \frac{2(x+y)}{(x+y)y} = \frac{y+2(x+y)}{(x+y)y}$$

$$= \frac{2x+3y}{y(x+y)} \quad \text{or} \quad \frac{2x+3y}{y^2+xy}$$

$$2. \quad \text{Expand and simplify: } (3x-1)(5x+3)(x-8) \quad \mathbf{15x^3 - 116x^2 - 35x + 24}$$

$$3. \quad \text{Factorise fully: } 10x^2 + 9x - 9 = 10(x-1.5)(x-0.6)$$

$$= 2(x-1.5) 5(x-0.6) = \mathbf{(2x+3)(5x-3)}$$

$$4. \quad \text{Simplify: } \frac{3 + \frac{1}{x}}{(4x)^{-1}} = \left(\frac{3x}{x} + \frac{1}{x}\right)(4x) = \frac{12x^2}{x} + \frac{4x}{x} = \mathbf{12x + 4}$$

$$5. \quad \text{Simplify: } \frac{x^2+7x+12}{x^2+4x} = \frac{(x+3)(x+4)}{x(x+4)} = \frac{(x+3)\cancel{(x+4)}}{x\cancel{(x+4)}} = \frac{x+3}{x}$$

$$6. \quad \text{If } \log_b(k) = 2 \text{ and } \log_b(j) = 5 \text{ what is } \log_b\left(\frac{j^2}{k}\right)$$

$$\log_b\left(\frac{j^2}{k}\right) = 2 \log_b(j) - \log_b(k) = 2 \times 5 - 2 = \mathbf{8}$$

$$7. \quad \text{Solve } 4^x = 19 \quad \log(4^x) = \log(19) \quad x \log(4) = \log(19)$$

$$x = \log(19) \div \log(4) \quad \mathbf{x = 2.124}$$

$$8. \quad \text{Solve: } \frac{x^2+4x+1}{x+3} = 5 \quad x^2 + 4x + 1 = 5(x+3)$$

$$x^2 + 4x + 1 = 5x + 15 \quad x^2 - x - 14 = 0$$

$$\mathbf{x = 4.275 \text{ and } -3.275}$$

(4 and 8 are Merit)