

Resource for Day 1 – Algebra and Equations – Thursday 19 October

1. Simplify the following:

a. $\frac{(2a^2b)^3 \times 3a^3b^{-3}}{4a^3b \times 6a^2b^8}$ (4)

b. $\frac{12^{x+1} \times 3^{x-1}}{36^{x-1}}$ (4)

c. $\frac{4^{x+1} - 2^{2x}}{2^{2x+2}}$ (3)

d. $\frac{\sqrt{12} - \sqrt{8}}{\sqrt{27} - \sqrt{18}}$ (3)

e. $\frac{4x^3 + 6x^2 - 8x - 2}{2x - 2}$ (4)

2. Solve the following:

a. $2x^{\frac{3}{5}} - 14 = 30$ (3)

b. $\frac{x}{a} + \frac{bx}{c} = d$ (3)

c. $x^3 - 16x = 0$ (3)

d. $(x-3)(x+2) = 6$ (3)

e. $x^2 - 4x - 9 = 0$ (3)
by completing
the square

f. $2x^2 + 5x - 9 = 0$ (5)
by completing
the square

g. $x^2 + px - \frac{3p^2}{4} = 0$ (3)

h. $\sqrt{2x-1} + x = 8$ (5)

i. $9^{x+2} = 27^{2x+1}$ (4)

j. $5^{x+1} = 20$ (2)

k. $7^{x+1} - 2(7^x) = 85$ (4)

l. $3^x - 4 - 7(3^{1-x}) = 0$ (6)

m. $\log_2(x^2 + 2x) = 3$ (3)

n. $\log_{x+2} 16 = 2$ (3)

o. $x(3-x) > -10$ (5)

p. $3x + 5y = 19$ (5)
 $4x - 2y = 8$
simultaneously

3. Find k if the equation $x^2 + kx + \frac{k}{2} + 2 = 0$ has non-real roots. (4)