EXPONENTIALS AND LOGARITHMS - CHAPTER REVIEW

1 Find the values of x for which the following are true.

(a) $7^{x+2} = 343$ **(b)** $4^{x-2} < 128$ **(c)** $3^x \geq 12$

2 Simplify:

(a) $\log_3 18 + 2\log_3 9 - \log_3 54$ **(b)** $\log_a(xy^2) + \log_a(yz^2) - \log_a(xz^2)$

2 Simplify: **(c)** $\log_{10}\frac{6+4\sqrt{6}}{5}+\log_{10}\frac{2\sqrt{6}-3}{2}$

(d) $2\log(x+1)-\log(x-1)-2\log(y+1)+\log(y-1)$, given $x=5$ and $y=2$

3 Express y in terms of x a) $log_a y = x$ b) $log_{10} y = 2 + log_{10} x - log_{10} x^2$

7 Use the change of base rule to give each expression as a single term involving natural logarithms.

(a) $\log_{10} 5$ **(b)** $3 + \log_3 6$

8 Solve for x:

(a) $\log_e(x+2) = \log_e(2x)$ **(b)** $\log_e(2x+3) = \log_e x^2$ **(c)** $\log_e x^2 = \log_e\left(\frac{x}{3}\right)$

9 Solve for x: **(a)** $2e^{x} = e^{3x}$ **(b)** $2e^{x+1} = e^{2x}$ **(c)** $2e^{-x} = e^{3x-4}$

10 $4000 is invested at 3% p.a. compound interest. How long does it take for this money to:

(a) double in value **(b)** grow to $10 000 **(c)** grow to $80 000?