Unit 6 Review **Secondary 3 Honors**

Precalculus Book:

p. 247: 9-12, 27, 29, 31, 35, 37, 43, 45, 47, 49, 65, 67, 73, 75, 81, 83, 87, 89, 94, 99, 100, 103, 107, 119, 121, 125, 145, 147, 150

Simplify

1a) $\log_3 3^{x^2}$

b) $7^{\log_7 51}$

c) $\ln e^{3x-2}$

d) $e^{\ln\sqrt{x}}$

e) $\frac{4a^{-1}b^2}{(2a^2b^3)^{-2}}$

Solve for x

2a) $3 = 9^{5x}$

b) $8^x = \frac{1}{4}$

c) $2^{x^2} \cdot 2^{4x} \cdot 2^{-9} = 8$

d) $2^{-2x} + 1 = 9$

e) $x^{2/3} = 16$

f) $\ln x - \ln 3 = \ln 15$

g) $3e^{2x} + 5 = 23$

h) $\log x^2 = 2$

3) The half-life of radioactive Uranium is 245,500 years.
   a) Use the formula $y = Ce^{kt}$ to solve for k. Round your answer to **8 decimal places.**
   b) If you begin with 20g of radioactive Uranium, write the specific equation for the model.
   c) Using your equation from part (b), how much will remain after 50,000 years?

4) Find $\lim_{x\to\infty} \frac{500}{1+3e^{-0.2t}}$

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