MHF 4UI **Unit #3 – Exponential and Logarithmic Functions – Exam Review**

1. Evaluate. If possible, state exact answers. Otherwise, round to two decimals.

a) $\log_3(81)$ b) $\log_6(1)$ c) $\log_5\left(\frac{1}{125}\right)$ d) $\log(1000)$

e) $\log_2(24)-\log_2\left(\frac{3}{2}\right)$ f) $\log_6(4)+\log_6(9)$ g) $\log_6\left(\frac{1}{216}\right)$ h) $\log_2(1024)$

2. Solve. If possible, state exact answers. Otherwise, round to four decimals.

a) $7(2)^{-x}=5^{2x+3}$ b) $3(4)^{x}=13^{3x-1}$

c) $-9e^{8x-5}+7=-20$ d) $\log(x)=2\log(3)+3\log(2)$

e) $\log_4(x+2)-\log_4(x-3)=\log_4(9)$ f) $6e^{4x+3}-5=13$

g) $\log_4(x+2)+\log_4(x-1)=1$ h) $\log_3(8x+7)+\log_3(x+1)=2$

i) $\ln(x^2-9)=1$ j) $e^x=5$

k) $\ln(5x-2)=7$ l) $e^{\frac{x}{3}}=2e$

3. A plug-in air freshener loses about 4% of its scent every 3 days. Find the number of days until the freshener only has 25% of its original scent. (Round your answer to the nearest day.)

4. The half-life of Cesium-144 is 282 days. How long is it until only 10% remains? (Round your answer to the nearest day.)

5. A collector comic book, currently worth $40, is predicted to grow in value 15%/a.

a) How much is this book predicted to be worth in 10 years?
b) How long would you have to wait for this book to **double in value**?

6. On each bounce a ball rises 70% of the height from which it fell. Let us agree that, for all practical purposes, the ball stops bouncing when the height to which it rises is only 0.1% of the height from which it was dropped originally. How many bounces will this take?

Answers:

1. a) 4 b) 0 c) –3 d) 3 e) 4 f) 2 g) –3 h) 10
2. a) –0.7368 b) 0.5807 c) 0.7623 d) 72 e) $\frac{29}{8}$ f) –.4753 g) 2 h) $\frac{1}{8}$
   i) $\pm\sqrt{e+9}$ j) $\ln(5)$ k) $\frac{e^7+2}{5}$ l) $3\ln(2e)$
3. 102 days
4. 937 days
5. a) $161.82 b) 5 years
6. 20 bounces