Exponential equations and Log equations

1) Rewrite each in exponential form

a) $\log_{10}(0.0002042) = -3.690$
b) $\log_2(117.2) = 6.873$
c) $\log_6(2.397) = 0.488$
d) $\ln(5.824) = 1.762$

2) Rewrite each in log form

a) 8^3.147 = 695.1
b) *e*^–2.487 = 0.08316
c) 10^4.39 = 24550
d) 2^0.169 = 1.124

3) Solve each equation

a) $\log_2(x) = -2.116$
b) $\log_{10}(x) = 0.0284$
c) $\ln(x) = 9.33$
d) $\log_5(x) = -3.87$
e) $\log_{10}(4.38) = x$
f) $\log_4(0.222) = x$
g) $\ln(46.5) = x$
h) $\log_2(15.32) = x$
i) $\log_{10}(-3.2) = x$
j) $\ln(0) = x$

4) Solve each equation

a) 10^*x* = 0.335
b) e^*x* = 7.42
c) 9^*x* = 9.32
d) 2^*x* = 1.92
e) *e*^*x* = 0
f) 10^*x* = –3.5
g) *e*^–0.254 = *x*
h) 7^3.559 = *x*
i) 10^–4.77 = *x*
j) 2^11.5 = *x*

Answers on next page

1)a) 10^–3.690 = 0.0002042
b) 2^6.873 = 117.2
c) 6^0.488 = 2.397
d) e^1.762 = 5.824

2)a) $\log_8(695.1) = 3.147$
b) ln(0.08316) = –2.487
c) $\log_{10}(24550) = 4.39$
d) $\log_2(1.124) = 0.169$

3)a) 0.2307
b) 1.068
c) 11300 (Notice this answer is written to only 3 sig figs. Your calculator gives many more. They are not needed.)
d) 0.00197
e) 0.641
f) –1.086
g) 3.839
h) 3.938
i) No solution
j) No solution

4)a) –0.475
b) 2.004
c) 1.016
d) 0.941
e) No solution
f) No solution
g) 0.776
h) 1018
i) 0.00001698
j) 2896

Exponentials. Warmup, graphs, and word problems

Warmup: The population of a city is 45,000 on Jan 1, 2017; then 47,000 on Jan 1, 2018. What was the rate of growth? (Write as a decimal or percent.)

Warmup #2: The population of a city is 102,000 on Jan 1, 2017. During 2017, it grew by 0.064 (6.4%) of its starting value. What is the population on Jan 1, 2018?

Graph #1: $y = 2^x$
Graph #2: $y = 40*2^x$
Graph #3: $y = 1.05^x$
Graph #4: $y = 3^{(x/5)}$
Graph #5: $y = (0.8)^x$
Graph #6: $y = 1.25^{-x}$
Graph #7: $y = e^x$
Graph #8: $y = e^{(0.1x)}$

Find an exponential model for each:

A) Population of a city starts at 30,000. It grows 2.7% per year.
B) Radioactive substance starts at 900 micrograms. It decreases by 21.7% each hour.
C) Money starts at $2,500. It doubles every 15 years.
D) Number of germs starts at 50,000. Rate of growth (per minute) equals 0.004 times the number present at that time.