

Alg 2 Chapter 6 Review version 2 Spring 2020

Round to the nearest hundredth unless noted otherwise or the situation dictates so.

The test will have one problem like either #1 or #2

*1. The population of a city has been increasing 3.5% each year. In 2012 the population was 80,000.

- Find the value of the population in 2020.
- Find the value of the population in 2005.
- In how many years will the population become 300,000?

*2. The value of a real estate investment has been decreasing 6.8% each year. In 2015 the value of the investment was \$125,000.

- Find the value of the investment in 2009.
- Find the value of the investment in 2025.
- In how many years will the investment be worth \$60,000?

*3. Use all three properties of logs to write each as a single log and for part (c) then evaluate.

- $4 \log X + 3 \log W - 2 \log Y$
- $7 \ln D - (5 \ln B + \ln A) + 6 \ln C$

*4. Use all three properties of logarithms to expand each as much as possible.

- $\log(J^2 K^3)^4$
- $\ln\left(\frac{N^5}{M^3 P^6}\right)$

For 5 to 12 solve each equation.

5. $8^{x-4} = 1000$

6. $5^{3x} = 6^{x+2}$

7. $4e^{x+3} - 7 = 30$

8. $\log_4(x-6) + \log_4 x = 2$

9. $25^{4x} = 125^{x+1}$

10. $\ln(x+4) + 9 = 15$

11. $\log(25x+1) - \log(x-8) = 3$

12. $\log_7(x^2-11) = \log_7(x+1)$

*13. Write the equation of the exponential function ($y = a \cdot b^x$) that passes through these two points: (3, 1836) & (6, 396576)

The test will have one problem like either #14 or #15

*14. The half-life of a radioactive substance is 20 minutes. There is 1000 kg of this substance at 11:00 am. Find the amount remaining at 2:15pm the same day.

*15. The number of cells doubles every 40 minutes. There are 16 cells at 6:00 am. Find the number of cells at 1:50pm.

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ANSWERS

1. eq is: $y = 80,000(1.035)^x$ $x = \#$ yrs since 2012

a) pop = 105,345 ($x = 8$) b) pop = 62,879 ($x = -7$)

c) $x = 38.42$ yrs

2. eq is: $y = 125,000(0.932)^x$ $x = \# \text{ yrs since 2015}$

a) value = \$190,728.04 ($x = -6$) b) value = \$61,811.48 ($x = 10$)

c) $x = 10.42$

3. a) $\log\left(\frac{X^4 W^3}{Y^2}\right)$ b) $\ln\left(\frac{C^6 D^7}{AB^5}\right)$

4. a) $8\log J + 12\log K$ b) $5\ln N - 3\ln M - 6\ln P$

5. $x = 7.32$

6. $x = 1.18$

7. $x = -0.77$

8. $x = 8$ (-2 is an extraneous solution)

9. $x = 0.6$

10. $x = 399.43$

11. $x = 8.21$

12. $x = 4$ (-3 is an extraneous solution)

13. $y = 8.5(6)^x$

14. 1.16 kg

$(1000(0.5)^{9.75})$

15. 55,109 cells

$(16(2)^{11.75})$