

Algebra 2
5.8 Applications of Logarithms

Name: ___CLASS COPY_____
Period: _____

Solve for x . Leave your answer in exact form, then round to three decimal places.

- $6^x = 59$
 - $8^{x+5} = 42$
 - $15^{6x} = 28$
 - $7^x + 5 = 9$
 - $3 \cdot 8^{x-11} = 36$
6. Greg bought a gold coin for \$9000. If the value of the coin increases at a constant rate of 1.79% year year, how many years will it take for the coin to be worth \$17,978.02?
7. A decaying substance loses 20% of its mass in one week. How long will it take for the substance to lose 75% of its mass?
8. Albert currently pays a \$608 premium for health insurance. If the premium increases at an annual rate of 8.01% per year, how many years will it take for the premium to be \$2086.06?
9. John created a chart which shows that the population of a town will increase to 96,627 people from a current population of 11,211 people. If the rate of increase is 4.18% each year, how many years will it take for this to happen?
10. The mass of a radioactive substance is declining at a rate of 3% a week. If the mass is initially 10 grams, how long will it take to weigh less than 1 gram?
11. Sarah has a government bond that will be worth \$20,876.86 in five years. If the bond has an annual interest rate of 7%, what is the present value of the bond?
12. Rachel deposits \$5000 in a bank account which credits interest at 3.5% compounded annually. How many years will it take for Rachel to have at least \$25,000 in her account?

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