# 4.6 WS 3

1. During the first decade of this century, the population of Irvine, California, grew exponentially. The population of Irvine was 143,110 in 2000 and 212,375 in 2010. Find the exponential growth function that models the population growth of Irvine and use it to predict the population 2016. Use $t = 0$ to represent 2000, $t = 10$ to represent 2010, and so on. Round to the nearest thousand.

2. Estimate the age of a bone if it now contains 65% of its original amount of carbon-14. Round to the nearest 100 years.

3. If $22,000 is invested at an annual interest rate of 2.75% for 5 years, find the balance if the interest is compounded
   a. Monthly
   b. Daily

4. Find the balance if $3200 is invested at an annual interest rate of 4% for 10 years, compounded continuously.

5. How long with it take $6000 to triple if it is invested in an account that pays 7.6% annual interest compounded continuously? Round to the nearest year.

**Solve the following equations. Be sure to check your answers.**

6. $3^x = 25$

7. $1 + \log(3x - 1) = \log(2x + 1)$

8. $6 - \log_5(3x - 2) = 4$

9. $e^{2x} - 3e^x + 2 = 0$

10. $4 + 3^{x+1} = 8$

11. $2e^{3x-5} = 7$

**Find the domain of the function.**

12. $f(x) = \log(2x + 7)$

13. $f(x) = \ln(x^2 - 15x + 26)$

14. $f(x) = \log_2\left(\dfrac{4}{13 - x}\right)$

**Write each equation in its exponential form.**

15. $3 = \log_2 8$

16. $-3 = \log_4\left(\dfrac{1}{64}\right)$

17. $\ln(x + 7) = 3$

18. $\log_3(x) = 3$

**Write each equation in its logarithmic form. Assume $y > 0$ and $b > 0$.**

19. $5^2 = 25$

20. $6^3 = 216$

21. $12.18 = e^{2.5}$

22. $7^2 = (2x + 5)$