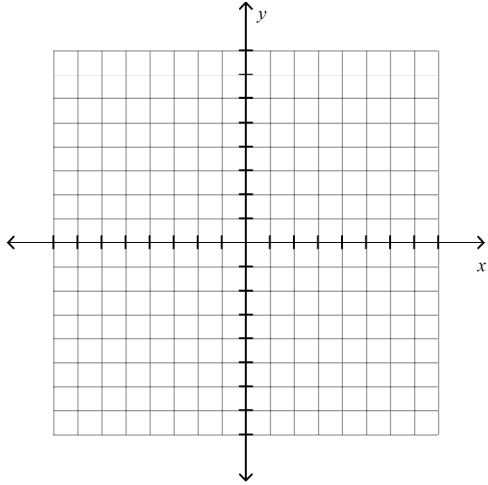
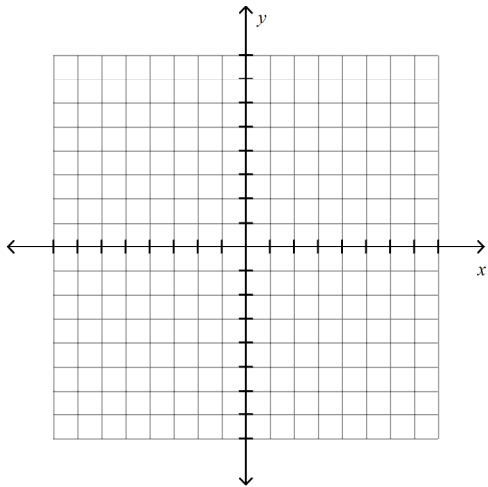


Algebra IIB Final Review Part 1

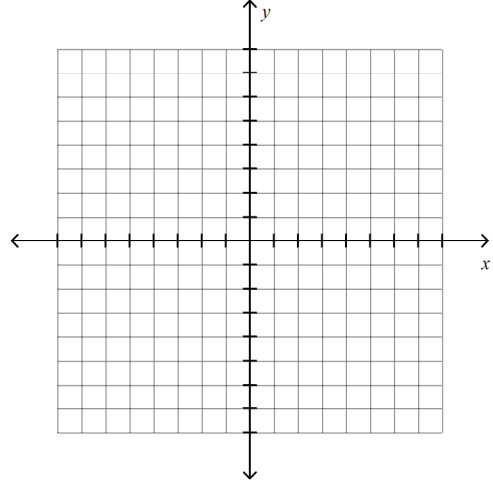
1. Graph: $y = 3^x$
(7.1)



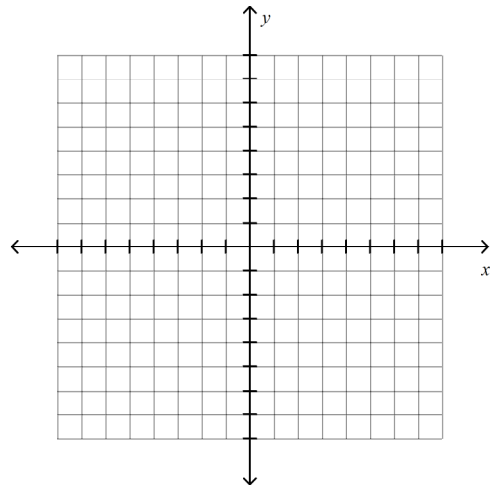
2. Graph: $y = 6\left(\frac{1}{3}\right)^x + 3$
(7.1)



3. Graph: $y = \log_4 x$
(7.5)



4. Graph: $y = \log_3 x - 2$
(7.5)



5. An initial population of 490 quail increases at an annual rate of 26%. (7.1)

a. Write an exponential function to model the quail population.

b. What will the approximate population be after 3 years? Round the answer to the nearest whole number.

6. Write the equation in logarithmic form. (7.2)
 $5^6 = 15625$

7. Write the equation in exponential form. (7.2)
 $\log_5 \frac{1}{125} = -3$

8. Evaluate the logarithm algebraically. $\log_3 2187$
(7.2)

9. Write the expression as a single logarithm. (7.3)
 $2 \log_b x + 7 \log_b v$

10. Expand the logarithmic expression. $\log_9 4b^3$
(7.3)

11. Solve the exponential equation. $27^{5x} = 9$
(7.4)

12. Solve $\log(2x + 5) = 2$. (7.4)

13. Solve $\log 5x - \log 14 = 1$. (7.4)

14. Use natural logarithms to solve the equation. Give the exact answer. Then give the approximated answer rounded to the nearest thousandth. (7.4)
 $7e^{2x} - 5 = 25$

15. The sales of lawn mowers t years after a particular model is introduced is given by the function $y = 5500 \ln(9t + 4)$, where y is the number of mowers sold. How many mowers will be sold 3 years after a model is introduced? Round the answer to the nearest whole number. (7.5)

16. The half-life of a certain radioactive material is 23 days. An initial amount of the material has a mass of 447 kg.

Write an exponential function, involving natural logarithms, that models the decay of this material. Give the exact answer. (7.5)

17. Given the half life equation of a certain radioactive material of $P_t = P_0 e^{\frac{\ln 0.5}{36} t}$ where the initial amount is 315kg and t is the amount of time in days, find how much radioactive material remains after 6 days. Round your answer to the nearest thousandth. (7.5)

18. State the vertical asymptote(s) of the rational function. (8.2)

$$y = \frac{-4}{x-2} - 1$$

19. State the horizontal asymptote of the rational function. (8.2)

$$y = \frac{5}{x+1} - 3$$

20. State the x-intercept(s) of the rational function. (8.2)

$$y = \frac{-3}{x-3} - 2$$

21. State the y-intercept of the rational function. (8.2)

$$y = \frac{-3}{x+4} - 2$$

22. Simplify. (8.4)

$$\frac{8m^7n}{20mn^5}$$

23. Simplify. (8.4)

$$\frac{2x+10}{4x-12} \cdot \frac{8x-24}{2x+7}$$

24. Simplify. (8.4)

$$\frac{x^2-7x+12}{x^2-9} \cdot \frac{x^2+5x+6}{x^2-6x-16}$$

25. Simplify. (8.4)

$$\frac{7m}{10n^5} \div \frac{21m^4}{20n}$$

26. Simplify. (8.4)

$$\frac{x^2 + x - 12}{x^2 - 2x - 24} \div \frac{x^2 + 3x - 18}{x^2 - 4x - 12}$$

27. Simplify. (8.5)

$$\frac{4x}{x^2 - 49} + \frac{9}{x + 7}$$

28. Simplify. (8.5)

$$\frac{7x}{x^2 - x - 12} + \frac{9}{x^2 - 8x + 16}$$