Honors Algebra 2 Exam Review Chapters 4-5-9-10

Chapter 4: Exponential and Logarithmic Functions

Know How to…….

- Graph Exponential ($y = 2^x$) and Log ($y = \log_3 x$) Functions
    - Asymptotes and Domain and Range
- Value of e
- Simplify exponents: know rules
- Interest Compounded continuously: $A = Pe^{rt}$
- Evaluate logs
- Expand logs/Condense logs
- Change of Base
- Solve Exponential Equations/ Solve Log Equations

Chapter 5: Rational Functions

- Inverse Variation
- Graph: list Vertical Asymptote, Horizontal Asymptote
- Add, Subtract, Multiply, Divide Fractions
- Solve equations with fractions
- Determine if function is odd or even

Chapter 9: Trigonometric Functions

- Evaluate 6 trig functions
- Use inverse function to solve angles
- Solve triangles using trig; Law of Sines and Cosines
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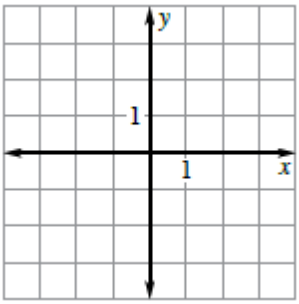
Chapter10: Trig Graphs, Identities, and Equations

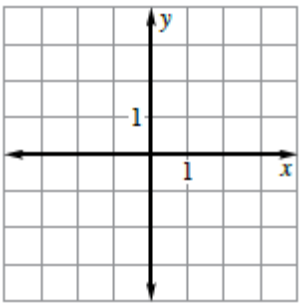
- **Graph sine and cosine functions**
- **Simplify with Identities: know Pythagorean Identities**
    - **Know tangent ratio and $sin^2x + cos^2x = 1$**
- **Solve trig equations over $0<x<2\pi$**
- **Use sum formulas**

Chapter 4: Graph the function. State the domain and range

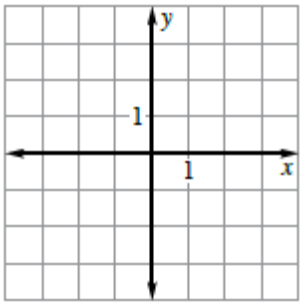
1. $y = 3 \cdot 2^{x-3}$



2. $y = \left(\frac{3}{4}\right)^x$



3. $y = e^x$



Simplify the expression.

4. $4e^3 \cdot e^5$

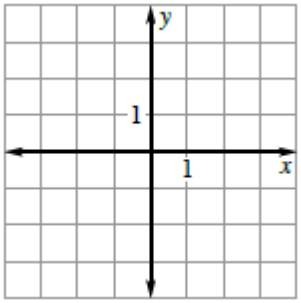
5. $(-4e^{2x})^3$

6. $\frac{e^{5x}}{4e^2}$

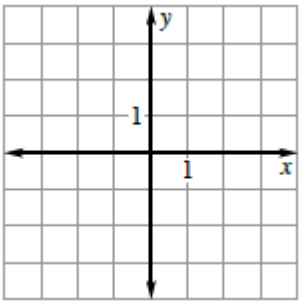
7. $\frac{9e^{6x}}{3e^{4x}}$

Graph the function. State the domain and range.

8. $y = 3e^x$



9. $y = 2e^{-4x}$



10. You deposit $3000 in an account that pays 5% annual interest compounded continuously. What is the balance after 2 years?

Evaluate the logarithm without using a calculator.

11. $\log_2 8$

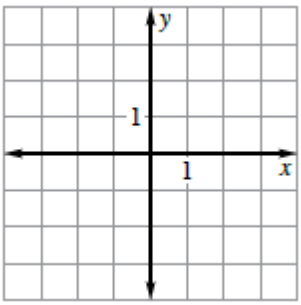
12. $\log_6 1$

13. $\log_5 5$

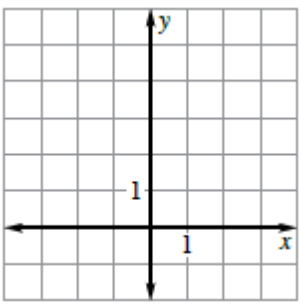
14. $\log_{1/3} 27$

Graph the function. State the domain and range.

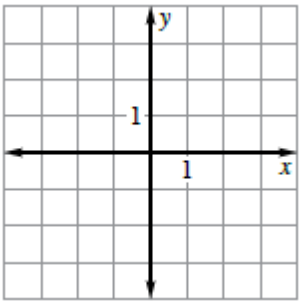
15. $y = \log_5 x$



16. $y = \ln x + 3$



17. $y = \log (x + 1) - 2$



Expand the expression.

18. $\log_3 4x$

19. $\ln 4x^2y^5$

Condense the expression.

20. $\log_5 24 - \log_5 6$

21. $\log_8 6 + 2 \log_8 3$

Use the change-of-base formula to evaluate the logarithm.

22. $\log_4 12$ **23.** $\log_9 18$

Solve the equation.

24. $3^{x+1} = 27^{x+3}$ **25.** $e^x = 5$ **26.** $2^{3x} + 9 = 25$ **27.** $4^{x+1} - 7 = 14$

28. $\log_6 (5x + 8) = \log_6(13x)$ **29.** $\ln (4x - 2) = \ln(8x)$ **30.** $9 \ln x = 54$ **31.** $\log_3(x + 7) = 3$

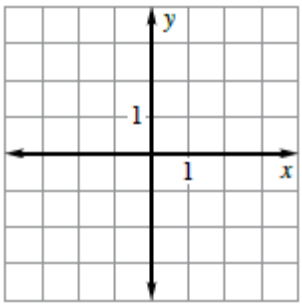
Chapter 5:

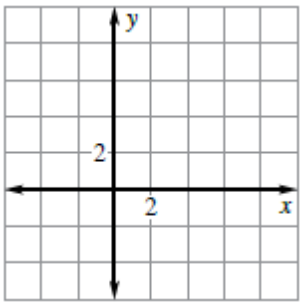
The variables *x* and *y* vary inversely. Use the given values to write an equation relating *x* and *y*. Then, find *y* when *x* = –2.

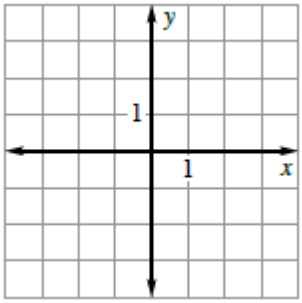
32. $x = 7, y = 2$ **33.** $x = 3, y = -8$

Graph the function.

34. $y = \dfrac{5}{4x}$ **35.** $y = \dfrac{5}{x-3} + 1$ 36. $y = \frac{3x}{4x+1}$







Perform the indicated operation and simplify.

37. $\dfrac{x^2-2x-15}{x^2+x-12} \cdot \dfrac{2x^2-6x}{x^3+3x^2}$ **38.** $\dfrac{x^2-10x+21}{x^2-4} \cdot \dfrac{x-2}{x-7}$ 39. $\dfrac{x^2+8x+12}{x^2-4} \div \dfrac{x^2+10x+24}{x^2+x-6}$

Perform the indicated operation and simplify.

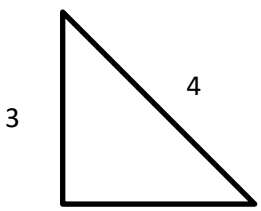
40. $\dfrac{1}{x+3} + \dfrac{1}{x-3}$ 41. $\dfrac{4}{x-4} - \dfrac{3}{x+2}$ **42.** $\dfrac{5x+4}{x^2-64} + \dfrac{3}{x-8}$

Solve the equation.

43. $\dfrac{x-3}{x-2} = \dfrac{9}{x+6}$ **44.** $\dfrac{x-6}{x-4} - \dfrac{3x-2}{x-4} = 4$ **45.** $\dfrac{3x+9}{x^2-9} = \dfrac{2x+7}{x-3}$

Chapter 9: Evaluate the six trig functions of angle θ.

46.



47. Sin $\theta = \frac{6}{11}$

48. Solve $right\ \Delta ABC$, if B = 23° and a = 12.

49. Solve if cos ɵ = .23 and 90 < ɵ < 180

50. Solve $\sin^{-1}\frac{\sqrt{2}}{2}$

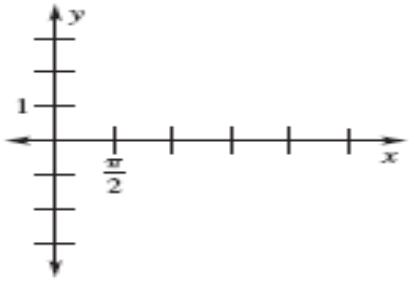
51. Solve ΔABC if A = 107°, B = 25° and b = 15

52. a = 12, b = 27, and c = 20

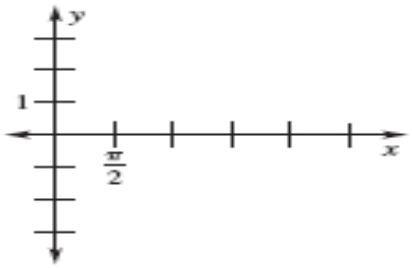
Chapter 10: Trig Graphs, Identities, and Equations

Graph the Functions. Label the x-axis.

53. $y = 2 \sin 4x$



54. $y = 3 \cos \pi x$



Simplify the Expression.

55. $\frac{\cos(\theta)}{\cot(\theta)}$

56. $\cos^2 x + \sin^2 x + \tan^2 x$

Solve the equation in the interval $0 < x < 2\pi$

57. $3 \tan^2 x = 1$

Find the exact value if: $\sin(a - b) = \sin a \cos b - \cos a \sin b$

58. sin 15°