Math II UNIT 2 Review Day One

{Direct, Inverse, Joint Variation; Exponential and Logarithmic Functions and Equations; Exponential Growth and Decay; Simplifying Exponential Expressions; Square root functions and solving radical equations}

1. The volume of gas varies directly as the temperature and inversely as the pressure. If the volume is 230 cubic centimeters when the temperature is 300ºK and the pressure is 20 pounds per square centimeter, what is the volume when the temperature is 270 ºK and the pressure is 30 pounds per square centimeter?
2. The centrifugal force of an object moving in a circle varies jointly with the radius of the circular path and the mass of the object and inversely as the square of the time it takes to move about one full circle. A 6 gram object moving in a circle with a radius of 75 centimeters at a rate of 1 revolution every 3 seconds has a centrifugal force of 5000 dynes. Find the centrifugal force of a 14 gram object moving in a circle with radius 125 centimeters at a rate of 1 revolution every 2 seconds.
3. The time, T minutes, taken for a stadium to empty varies directly as the number of spectators, S, and inversely as the number of open exits, E. It takes 12 minutes for a stadium to empty when there are 20 000 spectators and 20 open exits. How long does it take to empty the stadium when there are 36 000 spectators and 24 open exits?
4. Convert to logarithmic form: $6^{-2} = \frac{1}{36}$
5. Convert to logarithmic form: $125^{\frac{1}{3}} = 5$
6. Convert to exponential form: $\log_2 32 = 5$
7. Convert to exponential form: $\log_4 \frac{1}{64} = -3$
8. Evaluate using change of base formula: $\log_5 \frac{1}{625}$
9. Evaluate using change of base formula: $\log_{81} 9$
10. Solve the logarithmic equation: $\log_3(5 + 2x) = 4$
11. Solve the logarithmic equation: $\log_2(x - 6) = -3$
12. Identify as exponential growth or decay: $f(x) = 0.5\left(\frac{5}{2}\right)^x + 1$
13. Identify as exponential growth or decay: $f(x) = \frac{2}{3}(4)^{x-2}$
14. Describe all transformations from the parent function: $f(x) = 0.5\left(\frac{5}{2}\right)^x + 1$
15. Describe all transformations from the parent function: $f(x) = 20(4)^{x-2} - 3$
16. Describe all transformations from the parent function: $f(x) = \log_3(x + 4) - 7$
17. Identify the domain and range of the exponential function: $f(x) = 0.5\left(\frac{5}{2}\right)^x + 1$
18. Identify the domain and range of the exponential function: $f(x) = 20(4)^{x-2} - 3$
19. Identify the domain and range of the logarithmic function: $f(x) = \log_2(x - 8)$
20. Identify the domain and range of the logarithmic function: $f(x) = \log_3(x + 4) - 7$

21. Solve for the value of m: $5^{4m} = 275$

22. Solve for the value of h: $9^{2h-1} = 27^{3h+10}$

23. Solve for the value of j: $5 + 4^{j-1} = 48$

24. Identify the domain and range of the square root function: $f(x) = \sqrt{x+3} - 6$

25. Solve the radical equation for the value of x: $6 + \sqrt{2x-1} = 15$

SHOW all applicable work above. PLACE ALL ANSWERS below:

1.	**2.**	**3.**	**4.**	**5.**
6.	**7.**	**8.**	**9.**	**10.**
11.	**12.**	**13.**	**14.**	**15.**
16.	**17.** **Domain:** **Range:**	**18.** **Domain:** **Range:**	**19.** **Domain:** **Range:**	**20.** **Domain:** **Range:**
21.	**22.**	**23.**	**24.** **Domain:** **Range:**	**25.**