Name _____                                    Date _____
Mr. Schlansky                                            Pre Calculus

# *Unit 5: Exponents and Logarithms Review Sheet*

1. Justify why $\dfrac{\sqrt[3]{x^2y^5}}{\sqrt[4]{x^3y^4}}$ is equivalent to $x^{\frac{-1}{12}}y^{\frac{2}{3}}$ using properties of rational exponents, where $x \neq 0$ and $y \neq 0$.

2. For $n$ and $p > 0$, is the expression $\left(p^2n^{\frac{1}{2}}\right)^8 \sqrt{p^5n^4}$ equivalent to $p^{18}n^6\sqrt{p}$? Justify your answer.

**Solve the following equations for all values of x**

3. $3x^{\frac{2}{5}} - 11 = 289$                          4. $2x^{\frac{1}{5}} - 2 = -8$

**Solve the following equations for all values of x**

5. $27^x = 9^{x+2}$                    6. $64^{x-2} = 256^{2x}$

**Expand the following logarithms**

7. $\ln \dfrac{\sqrt{x}}{y^3}$                    8. $\log \dfrac{m^3 \sqrt{n}}{k^2}$

9. The expression $\dfrac{1}{2}\log m - 3\log n$ is equivalent to

(1) $\log \sqrt{m} + \log n^3$          (3) $\log \dfrac{m^2}{3\sqrt{n}}$

(2) $\log \dfrac{1}{2}m - 3\log n$          (4) $\log \dfrac{\sqrt{m}}{n^3}$

10. If $\log_{\delta} x = 3\log_{\delta} p - \left(2\log_{\delta} t + \dfrac{1}{2}\log_{\delta} r\right)$, then the value of $x$ is

1) $\dfrac{p^3}{\sqrt{t^2 r}}$

2) $p^3 t^2 r^{\frac{1}{2}}$

3) $\dfrac{p^3 t^2}{\sqrt{r}}$

4) $\dfrac{p^3}{t^2 \sqrt{r}}$

**Solve the following equations**

11. $\log_{16}(p^2 - p + 4) - \log_{16}(2p + 11) = \dfrac{3}{4}$

12. $\log_{(x+3)}(2x + 3) + \log_{(x+3)}(x + 5) = 2$
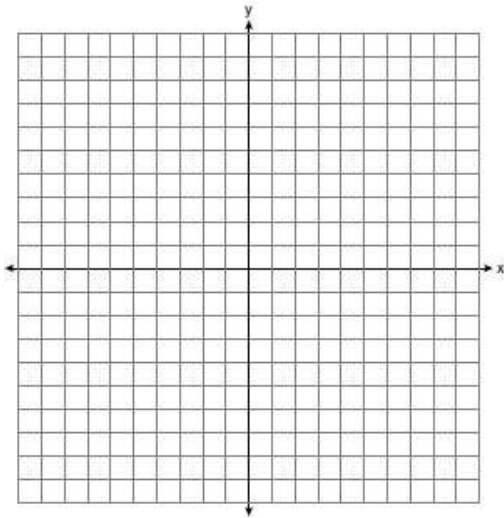
13. $\log(x - 6) - \log(3) = \log 6$

14. $\log_8(x - 40) - \log_8(x - 10) = \log_8(x + 2)$
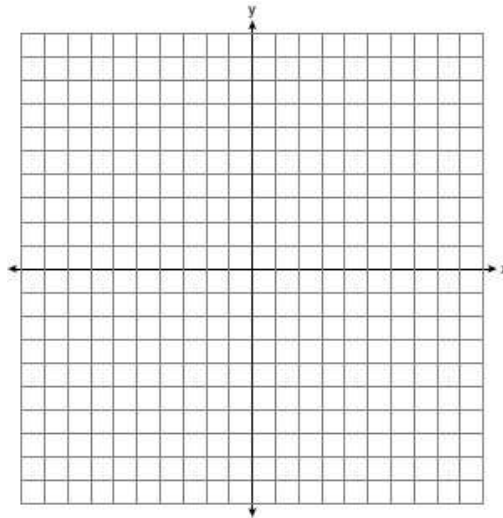
15. $8 + 2(4)^{-5x} = 14$

16. $256 + 3(2)^{6x} = 2700$

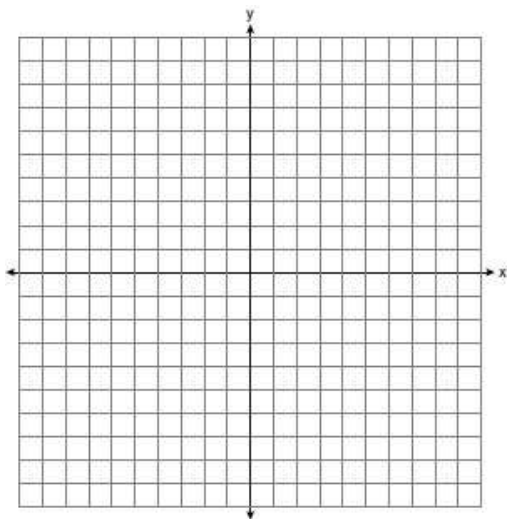**Graph the following equations on the grid provided**

17. $y = 2^{x+1} - 3$

18. $y = \left(\dfrac{1}{2}\right)^{x+6} - 3$

19. $y = \log_3(x+8) + 1$

20. $y = \log_2(x+9) - 3$