

1060 Review for Final Exam – Part 1

1. Simplify $\sqrt{(x^4 x^2)^{\frac{3}{4}}}$

2. Simplify $\left(\frac{3}{x}\right)^{-2}$

3. Simplify $\frac{x^{-1} y^2}{y^2 x^{-2}}$.

4. Simplify $\left(\frac{x^{-2}}{x^{-3}}\right)^{-4}$.

5. Simplify $\sqrt{\left(\frac{1}{x^3}\right)} \cdot x^{\frac{2}{5}}$.

6. Show that $(x + y)^2$ is not the same as $x^2 + y^2$.

7. Simplify $\frac{1}{\frac{1}{x^{-1}}}$.

8. Is $(x + y)^{-1}$ the same as $x^{-1} + y^{-1}$?

9. Show that $x^{\frac{1}{2}}$ and x^{-2} are not the same.

10. What is the domain of the function $f(x) = 2^x$? What is its range? What does its graph look like? Can you identify 4 points on the graph?

11. What is the domain of the function $g(x) = \left(\frac{1}{e}\right)^x$? Range? Graph? Identify 4 points?

12. Graph the function $h(x) = (.3)^{x-2} + 5$.

13. What is the inverse of the function $j(x) = 5e^x$?
14. What is the inverse of the function $k(x) = 2 \cdot 3^{4x+5} + 6$?
15. What is the inverse of the function $l(x) = 3\log_4(x - 1) + 1$?
16. What is the domain of the function $m(x) = \log_2(x + 2)$?
17. What is the domain of the function $n(x) = \frac{1}{\ln(x-1)}$?

Then we come to logarithms. Can you compute them? (Hint: a few of the below might be undefined.)

18. What is $\ln(e^2)$?

19. What is $\log_3 (27)^{-1}$?

20. What is $\log_2 0$?

21. What is $\log_{10} 1$?

22. What is the approximate value of $\log_2 e$? Is it a number less than 1? Between 1 and 2? Between 2 and 3? Bigger than 3?

23. What is $\log_5 \sqrt{5}$?

24. What is $\log_5 (-5)$?

25. What is $\log_5 \frac{1}{5}$?

26. What is $\log_5 25$?

27. What is $\log_5 \left(5^{\frac{3}{2}} \right)$?

Do you know the rules of logarithms and how to use them to simplify expressions?

28. What is $\log_6(2) + \log_6(3)$?

29. Simplify $\ln 16 - 5\ln 2 + \ln 1$.

30. True or false? $(\ln 3)^2 = \ln(3^2)$

31. True or false? $\frac{\ln x}{\ln y} = \ln x - \ln y$

32. Simplify $e^{\ln 17} - \log_2(4^{12})$.

33. What is $e^{4\ln \pi}$?

34. What is $\ln\left(\frac{1}{e^2}\right)^3$?

