

Final Review

1. $2 \left| \frac{1}{7}x + 2 \right| - 5 > 11$
2. $\frac{(5-2i)+(1+3i)}{(1+i)-(2-4i)}$
3. Factor: $(a^2 + 3)^2 - 11(a^2 + 3) - 26$
4. Solve: $x^3 - 9x^{\frac{3}{2}} + 8 = 0$
5. $(x^3 - 5x^2 - 2) \div (x - 4)$
6. $\left(\frac{x^2}{y^{-2}}\right)^{-4} \cdot \frac{2x^{-6}y^5}{16x^3y^{-2}}$
7. If $f(x) = 4 - 2x$ find $f^{-1}(100)$
8. Simplify: $\frac{11^{\frac{2}{5}}}{\frac{4}{11^{\frac{2}{5}}}}$
9. Given $f(x) = 3x^{-1}$ and $g(x) = 2x^2 - 2$
Find $f(g(x))$ and state the domain
10. Solve: $\sqrt{21x + 1} - 5 = x$
11. Graph and state the domain and range: $y = 2e^{-x+1} - 1$
12. Graph and state the domain and range: $h(x) = \log_3(x + 1) - 3$
13. Expand: $\ln \frac{\sqrt{2x}}{y^2}$
14. Solve: $25^{10x+8} = \left(\frac{1}{125}\right)^{4-2x}$
15. Solve: $-3e^{2x} + 16 = 5$
16. Solve: $\log_3(x - 9) + \log_3(x - 3) = 2$
17. Write an exponential function whose graph passes (1,2) and (3,50)
18. Graph and state the domain and range: $y = \frac{-3}{x-4} - 1$
19. Simplify: $\frac{x^2+12x+32}{6x+42} \div \frac{x^2+4x}{x^2-49}$
20. Simplify: $\frac{x+3}{x^2-2x-8} - \frac{x-3}{x^2-12x+32}$
21. Simplify: $\frac{x^{-1} - \frac{x}{x^{-1}+1}}{\frac{5}{x}}$
22. Solve: $\frac{10}{x} + 3 = \frac{x+9}{x-4}$
23. Solve: $\frac{5}{x+3} \geq \frac{4}{x+2}$
24. Write an equation of a tangent line to $x^2 + y^2 = 17$ at (1,4)
25. Graph $(x + 4)^2 = -8(y - 2)$
26. Write an equation of conic with vertices: (-3,4) & (5,4) and foci: (-1,4) & (3,4)
27. Write an equation of conic with foci: (4,-5) & (4,3) and eccentricity=2.5

28. Solve the system: $\begin{cases} 5x^2 + 25y^2 - 125 = 0 \\ -x + y^2 - 5 = 0 \end{cases}$
29. Expand: $(C - 4)^5$
30. Find the 3rd term of $(\frac{1}{x^2} - 4x^3)^{10}$
31. Write the series in summation notation: $\frac{1}{4} + \frac{2}{6} + \frac{3}{8} + \frac{4}{10} + \frac{5}{12} + \frac{6}{14} + \frac{7}{16}$
32. Write the Series in summation notation: $\frac{2}{3} - \frac{2}{9} + \frac{2}{27} - \frac{2}{81} + \dots$
33. $a_1 = 2, a_2 = 3, a_n = a_{n-1} \cdot a_{n-2}$; Find the 1st six terms
34. Evaluate:
- $\cos\left(\frac{7\pi}{4}\right)$
 - $\sec\left(\frac{11\pi}{6}\right)$
 - $\sin\left(\frac{-5\pi}{3}\right)$
 - $\tan(150^\circ)$
35. Evaluate:
- $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$
 - $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$
36. Graph $y = 3 \cos\frac{1}{2}\left(x - \frac{\pi}{2}\right) + 1$
37. Graph $y = 2 \tan\frac{1}{4}x$
38. Simplify: $\frac{\csc^2 x - \cot^2 x}{\sin(-x)\cot x}$
39. Solve: $2\sin^3 x = \sin x$
40. Probability: P.688 #65; P.710 #21; P.716 #7; P.722 #37; P.729 #43