**Solving Inequations Practice Problems – Student Generated**

1. $f(x)=\frac{2}{5}x^{\frac{3}{7}}+\frac{4}{5}x^{-\frac{4}{7}}>0$
2. $f(x)=\frac{5}{3}x^{\frac{1}{5}}+\frac{1}{3}x^{-\frac{4}{5}}>0$
3. $\frac{x^4-3x^3+2x^2}{x^2+4x-5}<0$
4. $\frac{4x^2\left(3x^2-16\right)-2x\left(-2x^3\right)}{\left(16-x^4\right)^2}>0$
5. $-4\left(x-2\right)^3+3\left(x-2\right)^2\left(2x+3\right)>0$
6. $\frac{7}{6}\left(\frac{3x^2+2x-1}{x^2-9}\right)^{-\frac{2}{3}}\cdot 3x^2\geq 0$
7. $\frac{3e^x-7e^{-x}}{4}\leq 5$
8. $2x-6x^{-3}<\frac{1}{6x^3}$
9. $-64x^{-\frac{1}{4}}+4x^{\frac{1}{4}}\geq 0$
10. $\frac{2}{5}x^{-\frac{16}{5}}-\frac{2}{5}\left(\frac{x^{\frac{3}{5}}}{x^{\frac{9}{5}}}\right)<0$
11. $x^{\frac{2}{3}}\left(\pi^{\left(\frac{x}{2}-4\right)}-1\right)^{-1}-4\left(\pi^{\left(\frac{x}{2}-4\right)}-1\right)^{-1}\geq 0$
12. $\frac{\frac{4}{5}x^{\frac{1}{3}}+x^{-\frac{4}{3}}}{x\cdot e^{\frac{3}{4}}-x\cdot e^{1/4}}<0$
13. $\frac{3d^5+96}{2\left(1-4d^2\right)^{\frac{2}{3}}}\geq 0$
14. $\frac{\left(3x^2-48\right)\left(x^2-1\right)^{-\frac{5}{2}}}{7}\leq 0$
15. $\frac{3x^5+x^3\left(3+8\right)-6x^3-x\left(5x^2-2\left(1-10\right)\right)}{\left(x^2-2\right)^6}>0$

16. $5\sqrt[5]{x^3}-\frac{21}{12}x^{-\frac{2}{5}}+\frac{3}{12\sqrt[5]{x^7}}\le 0$

17. $4\cos^4 x-26\cos^2 x>-8-8\cos^2 x;\ -\pi\le x\le\pi$

18. $12\sec^4 x-19\sec^2 x+4\ge 0;-\frac{\pi}{2}\le x\le\frac{\pi}{2}$

19. $(x^2-4)-\frac{3\left(x^2-4\right)}{x+1(x-3)}\le 0$

20. $\frac{-x^3\left(-3x\right)+2x^2\left(16-x^2\right)}{\left(16-x^2\right)^3}>0$

21. $4\cos^4 x+7>27\cos(2x)+15\sin^2 x-8$

22. $\frac{3}{4}(x^2-9)^{-1}(x+3)\ge 0$

23. $\frac{e^{2x}+8e^{-2x}}{3}-2>0$

24. $-\frac{2}{7}x^{-\frac{3}{5}}-5x^{\frac{2}{5}}-\frac{6}{7}x^{-\frac{8}{5}}>0$

25. $\frac{2}{5}x^{-\frac{3}{5}}-\frac{2}{5}x^{-\frac{7}{5}}>0$

26. $\frac{\left(2x^2\right)\left[5\left(3x-2\right)\left(4x-1\right)\right]-\left[\left(4x\right)\left(5x\right)\left(3x^2-1\right)\right]}{\left(x^6-1\right)^2}<0$

27. $5x\left(4x-1\right)^2\cdot 5\left(4x-1\right)<0$

28. $8x-16x^{-3}<0$

29. $\frac{\left[20\left(x-2\right)\left(x-3\right)\left(x^2+4\right)-4\left(5x^4-100x\right)-480\right]}{\left(x^2-4\right)^3}\ge 0$

30. $\frac{6x^2-24}{\left(x-2\right)\left(x^2-5\right)^{\frac{3}{7}}}\le 0$

31. $2\left(2x+4\right)^4+6\left(2x+4\right)^3+4\left(2x+4\right)^3+8\left(16x-8\right)\left(2x+4\right)^2\le 0$

32. $\frac{e^{-x}}{2x^{-3}}+\frac{x}{2e^x}<3x^2e^{-x}$

33. $-\frac{8}{6}x^{-\frac{5}{3}}+\frac{4}{3}x^{\frac{1}{3}}>0$

34. $-4e^{-x}+\dfrac{x^2}{e^x}<2xe^{-x}$

35. $\dfrac{(3x^{\frac{3x^2}{2}}-x^{\frac{3x^2+2}{2}})\cdot 2x^e}{2e^{2x}\cdot\ln(2x-1)}\geq 0$

36. $\dfrac{2x\left(4-x\right)-x^2\left(-1\right)}{\left(4-x^2\right)^2}\leq 0$

37. $\dfrac{(\cos x-3)(2-2\sin x)(2+2\sin x)}{\csc x}>1.5\sin(2x)-9\sin x;-\pi\leq x\leq\pi$

38. $\dfrac{4\cos x-4\cos^2 x-3\sin^2 x\cdot\cos x+\sin^2 x\cdot\cos^2 x}{\cos^3 x-\dfrac{1}{2}\cos x}\leq 0;-\pi\leq x\leq\pi$

39. $-30\sec^4 x<-24+58\sec^2 x;\quad 0\leq x\leq\pi$

40. $f\left(x\right)=\dfrac{1}{2}x^{\frac{2}{3}}+\dfrac{1}{4}x^{-\frac{1}{3}}>0$

41. $2\left[(e^x)^2+\dfrac{1}{e^{-x}}\right]-4>0$

42. $4x^{\frac{1}{2}}+16x^{-\frac{3}{2}}\geq 0$

43. $-16e^{-x}+\dfrac{x^2}{e^x}>-6xe^{-x}$

44. $-18x^{-\frac{1}{9}}+6x^{\frac{2}{9}}\geq 0$

45. $5x-10x^{-2}<0$

46. $45(e^{5z}-1)^{-1}+\dfrac{90z+180z}{e^{5z}-1}<45z^2\left(\dfrac{1}{e^{5z}-1}\right)-90z(e^{5z}-1)^{-1}$

47. $\dfrac{7}{3}\left(x^2-16\right)^{-\frac{1}{5}}\cdot\left(4x\right)\leq 0$

48. $\dfrac{x^{\frac{9}{5}}+x^{\frac{4}{5}}}{\ln(x+2)}\geq 0$