1. $(x^2+3x+1)(x^2+3x-3)\geq 5$

2. $(x^2-x-1)(x^2-x-7)<-5$

3. $2x^2+2x+1<\dfrac{15}{x^2+x+1}$

4. $(x^2-2x)(2x-2)-9\dfrac{2x-2}{x^2-2x}\leq 0$

5. $(x^2+3x)(2x+3)-16\dfrac{2x+3}{x^2+3x}\geq 0$

6. $(x+3)^4+(x+5)^4\geq 4$

7. $x^4-10x^3+35x^2-50x+24>0$

8. $\dfrac{x^3+1}{x^4+x^3-10x^2-13x+21}>0$

9. $\dfrac{1}{1+2x}-\dfrac{2}{2+3x}+\dfrac{3}{3+4x}<\dfrac{4}{5x+4}$

10. $\dfrac{1}{x}-\dfrac{1}{1+x}+\dfrac{1}{2+x}-\dfrac{1}{3+x}-\dfrac{1}{4+x}+\dfrac{1}{5+x}-\dfrac{1}{6+x}+\dfrac{1}{7+x}>0$

11. $\dfrac{x^2+2x+2}{x+1}+\dfrac{x^2+8x+20}{x+4}>\dfrac{x^2+4x+6}{x+2}+\dfrac{x^2+6x+12}{x+3}$

12. $\begin{cases}\dfrac{x^2+10x+25}{4x-5}\geq 0\\ (x-2)(x^2-6x+9)\leq 0\end{cases}$

13. $\begin{cases}\dfrac{3x-1}{2x+1}\geq 1\\ \dfrac{3x-1}{2x+1}<2\end{cases}$

14. $\begin{cases}0.\overline{3}\,x^{-1}<1\\ x+4x^{-1}\geq 1.\overline{3}\,x\\ 9x^2-9x+1<0\end{cases}$

15. $\begin{cases}x^3-5x^2+10x-12\leq 0\\ x^2-4x+3\geq 0\\ x^2-6x+8\leq 0\end{cases}$

16. $\begin{cases}x^4-x^3-x^2-x-2\leq 0\\ x^4-2x^3+x^2-8x-12\geq 0\end{cases}$

17. $1<\dfrac{3x^2-7x+8}{x^2+1}\leq 2$

Answer key

1. $(-\infty,-4]\cup[-2,-1]\cup[1,+\infty)$ **2.** $(-2,-1)\cup(2,3)$ **3.** $x\in(-2,\ 1)$ **4.** $(-\infty,-1]\cup(0,1]\cup(2,3]$

5. $[-4,-3)\cup[-3/2,0)\cup[1,+\infty)$ **6.** $x\in(-\infty,-4-\sqrt{\sqrt{10}-3}]\cup[-4+\sqrt{\sqrt{10}-3},\ \infty)$

7. $x\in(-\infty,\ 1)\cup(2,\ 3)\cup(4,\ \infty)$ **8.** $x\in(-1,\ 1)\cup(3,\ \infty)$

9. $x\in(-4/5,\ -3/4)\cup(-2/3,\ -1/2)\cup(-0,\ \infty)$

10. $x\in(-7,\ -6)\cup(-5,\ -4)\cup(-7/2,\ -3)\cup(-2,-1)\cup(0,\infty)$

11. $x\in(-4,\ -3)\cup(-5/2,\ -2)\cup(-1,\ 0)$ **12.** $x\in\{-5,\ 3\}\cup(5/4,\ 2]$ **13.** $x\in(-\infty,\ -3)\cup(2,\ \infty)$

14. $x\in(\dfrac{1}{3},\dfrac{3+\sqrt{5}}{6})$ **15.** $x\in\{3\}$ **16.** $x\in\{-1\}$ **17.** $[1,6]$