1.7: Solving Inequalities

1. The solution set, in interval notation, of the inequality $\frac{1}{x-3} \geq \frac{1}{x-5}$, is

A) $(3,5)$

B) $(-\infty, 3) \cup (5, \infty)$

C) $(-5, -3)$

D) $[3,5]$

E) $(-\infty, -5) \cup (-3, \infty)$

2. The solution set of the inequality $\frac{x}{2} \geq \frac{2}{x}$, is

A) $[-2,0) \cup [2, \infty)$

B) $(-\infty, -2] \cup (0,2]$

C) $(-\infty, -2] \cup [0,2]$

D) $[-2,0] \cup [2, \infty)$

E) $(-\infty, -1] \cup (1, \infty)$

3. The solution set of the inequality $-\frac{1}{2} \leq \frac{4-3x}{5} \leq \frac{1}{4}$, is

A) $\left[\frac{11}{12}, \frac{13}{6}\right]$

B) $\left[\frac{5}{12}, \frac{5}{6}\right]$

C) $\left[\frac{13}{12}, \frac{13}{6}\right]$

D) $\left[\frac{11}{10}, \frac{13}{5}\right]$

E) $\left[\frac{13}{6}, \frac{11}{5}\right]$

4. The solution set in interval notation for the inequality $\frac{3}{x-2} < 1$ is

A) $(-\infty, 2) \cup (5, \infty)$

B) $(-\infty, 2) \cup (2, \infty)$

C) $(2,5)$

D) $(2, \infty)$

E) $(5, \infty)$

5. The solution set of the inequality $x^3 + 4x^2 - 9x \geq 36$ in interval notation is:

A) $[-4, -3] \cup [3, \infty)$

B) $[-4, -3] \cup [4, \infty)$

C) $(-4, -3) \cup (3, \infty)$

D) $(-3,3) \cup (3, \infty)$

E) $(3,4) \cup (4, \infty)$

6. The solution set, in interval notation of $\frac{2x-3}{x^2-36} \leq \frac{1}{x+6}$ is

A) $(-\infty, -6) \cup [-3,6)$

B) $(-\infty, -6) \cup [-3, \infty)$

C) $(-6, -3] \cup (3,6)$

D) $(-\infty, 3/2) \cup [6, \infty)$

E) $(-6,3/2] \cup [6, \infty)$

7. The solution set of $(x+1)(x^2+10x+25) \geq 0$ is:

A) $[-1, \infty) \cup \{-5\}$

B) $(-\infty, -5] \cup \{-1\}$

C) $(-\infty, -5] \cup [-1, \infty)$

D) $[-1, \infty)$

E) $(-\infty, -1]$

8. The set of all real values of k for which the equation $3x^2 - 2(k+1)x + 3 = 0$ has only nonreal solutions is:

A) $(-4,2)$

B) $(-\infty, -4)$

C) $(-\infty, -4) \cup (2, \infty)$

D) $(-\infty, 2)$

E) $(-4, \infty)$

9. The solution set of $\frac{(x-2)^5(x^2+1)(x-3)^2}{(4-x)^3} \leq 0$ is:

A) $(-\infty, 2] \cup \{3\} \cup (4, \infty)$

B) $(-\infty, -1] \cup [2,3] \cup [4, \infty)$

C) $(-\infty, 2] \cup [4, \infty)$

D) $[2,4) \cup \{3\}$

E) $[-1,2] \cup [3,4)$

10. The solution set, in interval notation, of the inequality $\frac{9}{x} \geq x - 8$

A) $(-\infty,-1] \cup (0, 9]$

11.The solution set, in interval notation, of the inequality

$$\frac{-x^2+x+6}{(x+1)(x^2+1)} \leq 0$$

A) $[-2,-1) \cup [3,\infty)$

12.If $|3-2x| \leq 5$ is equivalent to $m \leq 5x+2 \leq n$, then:

A) $m=-3$ and $n=22$

13. The solution set of the compound inequality $3x + 5 > 0$ and $9x + 2 \geq 4(x + 3)$ in interval notation is

A) $[2, \infty)$

14. The solution set in interval notation of the inequality $\frac{5}{x-1} \leq \frac{2}{x-2}$ is

A) $(-\infty, 1) \cup \left(2, \frac{8}{3}\right]$

15.The solution set, in interval notation, of the inequality $\frac{x^2-2}{x} \geq \frac{2x+1}{x}$ is

A) $[-1,0) \cup [3,\infty)$

16.The solution set of the inequality $\frac{(9x-11)(2x+7)}{(3x-8)^3} < 0$ in interval:

A) $\left(-\infty,-\frac{7}{2}\right) \cup \left(\frac{11}{9},\frac{8}{3}\right)$

17.The solution set of the inequality $\frac{4}{2-x} \geq \frac{3}{1-x}$ in interval notation is:

A) $(-\infty, -2] \cup (1,2)$

18.The solution set in interval notation of the inequality $\frac{5}{x} \leq \frac{-5}{3x+2}$ is:

A) $\left(-\infty, -\frac{2}{3}\right) \cup \left[-\frac{1}{2}, 0\right)$

19.If the solution set, in interval notation, of the inequality $1 > \frac{5+3x}{-2} > -10$, is (p, q), then $p + q =$

A) $\frac{8}{3}$

20.The solution set, in interval notation, of the inequality $x - 1 \leq \frac{12}{x}$ is

A) $(-\infty, -3] \cup (0,4]$

B) $(-\infty, -4] \cup (0,3]$

C) $[-3,0) \cup [4, \infty)$

21.The solution set of the inequality $-\frac{3}{2} \leq \frac{2-x}{6} \leq \frac{5}{3}$ is

A) $[11, \infty)$

B) $(-\infty, \infty)$

C) $[-8,11]$

22.The solution set of the inequality $\frac{2x-3}{x+1} \geq 1$ is

A) $(-\infty, -4)$

B) $(-\infty, -1) \cup [4, \infty)$

23.The values of k, in interval notation, for which the equation $x^2 + kx + 3k = 5$ has NO real solution, is

A) $(2, 10)$

B) $(0, 2)$

C) $(0, 12)$

D) $(-\infty, 2) \cup (10, \infty)$

E) $(-\infty, 0) \cup (12, \infty)$

24. The set of all real values of k, in interval notation, for which the quadratic equation $x^2 - 4x + k = 1$ has two distinct real solutions is

A) $(-\infty, 5)$

B) $(-\infty, -5)$

C) $(3, \infty)$

D) $(-\infty, 3)$

E) $(5, \infty)$

25. If the quadratic equation $2x^2 + kx + k - \frac{3}{2} = 0$, has two nonreal complex roots, then:

A) $2 < k < 6$

26. The solution set, in interval notation, of the inequality $\frac{x^2-4x+4}{x^2-9} \geq 0$ is

A) $(-\infty, -3) \cup (3, \infty) \cup \{2\}$

27.The solution set of the inequality $x + \frac{1}{x} \geq 0$ is

A) $(0, \infty)$

B) $[0, \infty)$

C) $[-1,1]$

D) $(-\infty, -1] \cup (0,1]$

E) $[-1,0) \cup [1, \infty)$

28.The solution set of the inequality $x^2 - 2x + 1 \leq 0$ is

A) $\{1\}$

B) $\emptyset$

C) $(-\infty, \infty)$

D) $(-\infty, 1)$

E) $(-\infty, 1) \cup (1, \infty)$

29. The solution set of the absolute value inequality $|x|^2 + |x| \geq 2$, is

A)$(-\infty, -1] \cup [1, \infty)$

B) $(-\infty, -2] \cup [1, \infty)$

C) $(-\infty, -2] \cup [2, \infty)$

D) $(-\infty, -1]$

E) $(-\infty, -2]$