

1. Resuelve la inecuación:

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|------------------------------|------------------------------|---------------------------------|---------------------------------|
| 1. $3x-3(x+1) < 2(x+1)-6$ | 2. $2(x-3)+x > 2(3x-1)-6$ | 3. $4x-2(x+1)+7 \leq 3(x+3)$ | 4. $3(x-1)-3(3x-1) \geq 1-2x$ |
| 5. $2(2x+1)-3(x-1)-2x < 6$ | 6. $3(2x+3)-2(2x+3) > 4x$ | 7. $2(2x-1)+x \leq 2(3x+1)-6$ | 8. $3(x+2)+2x-11 \geq 3(x-2)$ |
| 9. $2(3x+1)-8x < 5-2(x+1)$ | 10. $2(2x-3)-2(3x-1)+3 > 0$ | 11. $5x-2(x-3)-2(2x+1) \leq 6$ | 12. $7x-2(x+2) \geq 3(2x-1)-3$ |
| 13. $6x-2(2x+3)+4 < 2(x-1)$ | 14. $x-4 > 3(3x+1)-2(2x+3)$ | 15. $2(3x-2)-5x+7 \leq 2(x+1)$ | 16. $3(x+2)+3x-8 \geq 2(3x-1)$ |
| 17. $2(x+1)+2(3x+3)-9 < 6x$ | 18. $3(x+3)+3(2x-2)-8x > 4$ | 19. $2(x+1)-3(2x-3) \leq 11-4x$ | 20. $2(x+1)-10x \geq 5-2(2x+1)$ |
| 21. $2(x+2)-2(2x-1)-x-4 < 0$ | 22. $2(x+1)-3(3x-3)+7x > 11$ | 23. $3(3x+1)-2(x-3)-7x \leq 9$ | 24. $2(x+3)+7x+4 \leq 3(3x+3)$ |

2. Resuelve la inecuación:

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| 1. $\frac{25}{27} - \frac{x-2}{9} < 1$ | 2. $\frac{11}{18} + \frac{x+3}{9} > 1$ | 3. $\frac{x+8}{12} - \frac{x-2}{3} \leq 1$ | 4. $\frac{3x}{2} - \frac{3x-1}{3} \geq 1$ | 5. $\frac{x+3}{10} - \frac{x-2}{5} < 1$ |
| 6. $\frac{7x}{5} - \frac{3x-2}{2} > 1$ | 7. $\frac{x+2}{2} - \frac{5x-1}{8} \leq 1$ | 8. $\frac{x+3}{4} - \frac{5x-4}{24} \geq 1$ | 9. $\frac{x+1}{5} - \frac{2-7x}{10} < x$ | 10. $\frac{2x+1}{2} - \frac{5-x}{9} > x$ |
| 11. $\frac{x-2}{4} + \frac{11x+9}{20} \leq x$ | 12. $\frac{9x+2}{12} - \frac{2x-1}{2} \geq 1$ | 13. $\frac{x+2}{5} - \frac{7x-17}{30} < 1$ | 14. $\frac{1+3x}{5} - \frac{1-3x}{6} > x$ | 15. $\frac{1+3x}{5} - \frac{1-3x}{10} \leq x$ |
| 16. $\frac{2+23x}{30} - \frac{1-x}{5} \geq x$ | 17. $\frac{5x-1}{6} + \frac{2x+3}{15} < x$ | 18. $\frac{2x+3}{12} + \frac{3x-1}{6} > x$ | 19. $\frac{4+3x}{9} - \frac{2-3x}{6} \leq x$ | 20. $\frac{x-7}{18} + \frac{2x-1}{2} \geq x-1$ |
| 21. $\frac{7x-5}{8} + \frac{x-2}{4} < x-1$ | 22. $1 - \frac{2-x}{2} > x - \frac{5x-3}{10}$ | 23. $x - \frac{2x-3}{2} \leq 2 - \frac{7-x}{16}$ | 24. $\frac{7x+3}{8} - \frac{x-2}{4} \geq x+1$ | 25. $\frac{2(x+1)}{3} - \frac{8x-3}{12} < 1$ |

3. Resuelve la inecuación:

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|------------------------------|-------------------------------|----------------------------|-----------------------------|------------------------------|
| 1. $2x(3x-1) < 1-x$ | 2. $2(2x^2+3x) > 9x$ | 3. $x(x+1)-2x \leq 2x^2$ | 4. $6x-2(x-2) \geq 3x^2$ | 5. $2-2x(3x-2) < 3x$ |
| 6. $2x(3x+2) > 5x+2$ | 7. $3(3x-1)-2x \leq 2x^2$ | 8. $3x(x-1)+4x \geq 6x^2$ | 9. $2(2x^2+2x)-7x < 0$ | 10. $18x^2-3(3x^2+1) > 1$ |
| 11. $3(3x-1)-7x-2 \leq x^2$ | 12. $3(2x+1)+x^2-2 \geq 4x$ | 13. $2(2x-2)+2x^2+2 < x$ | 14. $x(3x-2)-5x^2-x > 0$ | 15. $3(2x+1)-5x \leq x^2+3$ |
| 16. $6x-x^2-7 \geq 3(2x-2)$ | 17. $x(2x-2)+8x+9 \leq x^2$ | 18. $8x-6x^2 < 3(x+2)-5$ | 19. $3x+2 > 2(x^2+x)+x^2$ | 20. $9x-x(x+3)-1 < 8x^2$ |
| 21. $x^2+2x \leq 2x(x+2)-3$ | 22. $-3(x^2-x)-x^2-1 \geq 3x$ | 23. $3(x^2+2x)-2x^2 < 5x$ | 24. $5x^2+3x > 2(2x^2+x)$ | 25. $x(x-2)-10x^2-1 < 4x$ |
| 26. $7x-16 \leq 2x^2-x(x+1)$ | 27. $1-2x^2 \geq 2x(x-1)+2x$ | 28. $2x-7x^2 < 1-3(x^2+x)$ | 29. $3x(2x-2)-15x^2 \geq 1$ | 30. $x(2x-3)-3x^2 \geq 4-7x$ |

4. Resuelve la inecuación:

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| 1. $\frac{x(x-2)}{5} - \frac{1-5x^2}{10} < x^2$ | 2. $\frac{7x^2+1}{8} + \frac{x(x+1)}{4} > x^2$ | 3. $\frac{x^2-x+16}{18} - \frac{x(x-2)}{6} \leq 1$ | 4. $\frac{x^2+4x-3}{12} - \frac{x(x-1)}{4} \geq x$ |
| 5. $\frac{x^2+3}{2} - \frac{6x^2-1}{10} + x^2 < 2$ | 6. $\frac{x(3x-11)}{20} + x > \frac{x(x+2)}{5}$ | 7. $\frac{x(1-x)}{3} - \frac{x^2-7x+2}{24} \leq x$ | 8. $x - \frac{x+1}{5} - \frac{3(2x-3)}{10} \geq 1$ |
| 9. $\frac{2-x+5x^2}{12} - \frac{1-3x^2}{6} < x^2$ | 10. $\frac{20x+23}{24} - \frac{x(x-1)}{6} > x+1$ | 11. $x^2 - \frac{7x^2-3}{8} - \frac{x(x-2)}{4} \leq 2$ | 12. $\frac{7x^2-8x+7}{16} - \frac{x(x-2)}{2} \geq 2$ |
| 13. $\frac{x^2+2}{6} + \frac{x(x+3)}{2} < x^2+2x$ | 14. $\frac{x(3x+2)}{2} - \frac{13x-3}{8} > 3x^2$ | 15. $x^2 - \frac{x(3x+1)}{3} \leq \frac{2x(x-5)}{27}$ | 16. $\frac{x(x+1)}{3} - \frac{5x^2-10x-1}{18} \geq x$ |
| 17. $\frac{3(x+1)(x-1)}{10} - \frac{2-x^2}{5} < x^2$ | 18. $\frac{5x^2+2x+1}{8} - \frac{x(1-x)}{2} > x^2$ | 19. $\frac{x(2x+3)}{3} - \frac{19x^2+1}{30} \leq x$ | 20. $\frac{13x^2+2}{6} - \frac{x(2x-3)}{3} \geq x+3$ |
| 21. $\frac{x(x+1)}{3} - \frac{2x-2-9x^2}{12} < x^2$ | 22. $\frac{x(5x+6)}{8} + \frac{x(x-1)}{4} > x^2+x$ | 23. $\frac{4x^2-x+4}{8} + \frac{x(3x+2)}{12} \leq x^2$ | 24. $\frac{x(x-1)}{4} - \frac{3x^2+2x-4}{8} \geq 1$ |

5. Resuelve la inecuación:

1. $x^3 - 1 < 3x(x-1)$
2. $2-x-12x^2 < 9x^3$
3. $x^2(2x+5) < x+6$
4. $x^2(x-1) \geq 3(1-x)$
5. $x^2(x-2)+x-2 < 0$
6. $x^2(5-x) > 7x+13$
7. $5x+6 \geq x^2(2x+3)$
8. $x^2(6x+11) > 3x+2$
9. $x^3+3x^2+7x+5 \geq 0$
10. $x^2(x-6) > 4(2-3x)$
11. $x^2(x+1)-3x+2 \leq x^2$
12. $15x+18 \leq x^2(2x+1)$
13. $x^2(x+1)+2(x+1) > 0$
14. $20x-12 \leq x^2(3x+1)$
15. $x^2(2x-9) \geq 4(1-3x)$
16. $9x^3-18x^2+11x-2 < 0$
17. $x(x^2+1)+3(x^2+1) \leq 0$
18. $x^2(x-5)+4(2x-1) > 0$
19. $2x(3x^2+8) \leq 19x^2+4$
20. $x^2(x+6)+12(x+1) \geq 4$
21. $6-9x^3 > x^2(1-3x)-11x$
22. $x(11x-12)+7 \geq 3(1+x^3)$
23. $4x^2(2x+3)+3(2x+1) \leq 2$
24. $x(x+1)(x-1) < (x+1)(x-1)$

6. Resuelve la inecuación:

1. $\frac{2}{x-2} < 0$
2. $\frac{1}{x+1} \geq 0$
3. $\frac{3}{2-x} \leq 0$
4. $\frac{2}{3-2x} > 0$
5. $\frac{-1}{2x+1} < 0$
6. $\frac{-4}{2x-1} > 0$
7. $\frac{-3}{1-2x} \leq 0$
8. $\frac{-1}{3-2x} \geq 0$
9. $\frac{x+1}{x-2} < 0$
10. $\frac{x-2}{2x+1} > 0$
11. $\frac{2x-1}{x} \leq 0$
12. $\frac{x-1}{2x-3} \geq 0$
13. $\frac{1+x}{1-x} < 0$
14. $\frac{2x+1}{-x-2} > 0$
15. $\frac{2-3x}{2+3x} \leq 0$
16. $\frac{1+2x}{1-2x} \geq 0$
17. $\frac{1}{x^2-1} < 0$
18. $\frac{-2}{4-x^2} > 0$
19. $\frac{3}{x^2-x-2} \leq 0$
20. $\frac{1}{x^2+2x+1} \geq 0$
21. $\frac{-2}{x^2+4x+3} < 0$
22. $\frac{1}{2-x-x^2} > 0$
23. $\frac{9}{1-9x^2} \leq 0$
24. $\frac{-3}{x^2-3x+2} \geq 0$
25. $\frac{x^2}{x-2} < 0$
26. $\frac{x+1}{x^2+1} > 0$
27. $\frac{2x-1}{x^2+4} \leq 0$
28. $\frac{3x^2}{2x+2} \geq 0$
29. $\frac{x^2-1}{x+2} < 0$
30. $\frac{x-1}{x^2-2x} \geq 0$
31. $\frac{x+2}{x-x^2} \geq 0$
32. $\frac{1-2x}{1-x^2} > 0$
33. $\frac{2-x}{2-x-x^2} < 0$
34. $\frac{2+x-x^2}{x-1} < 0$
35. $\frac{2-x-x^2}{2-x} \geq 0$
36. $\frac{x^2-2x-3}{2x-1} > 0$
37. $\frac{x-2}{x^2+3x+2} \leq 0$
38. $\frac{2x^2-3x-2}{1-x} > 0$
39. $\frac{2-3x-2x^2}{2-x} \leq 0$
40. $\frac{3-x}{2x^2+3x+1} \leq 0$
41. $\frac{1-x^2}{x^2-x-6} \leq 0$
42. $\frac{x^2-2x-3}{x^2-3x+2} \geq 0$

7. Resuelve la inecuación:

1. $\frac{x-3}{x+1} > 2$
2. $\frac{2}{x-1} < x$
3. $\frac{3}{x-2} > x$
4. $\frac{1}{2-x} < x$
5. $\frac{2}{2-x} > x$
6. $\frac{x+2}{2x-1} < 1$
7. $\frac{2+x}{1-2x} < 1$
8. $\frac{2x-5}{x-3} \leq 3$
9. $\frac{x+1}{2x-1} \geq 1$
10. $\frac{1-x}{1+2x} > 1$
11. $\frac{1}{2x-1} \leq x$
12. $\frac{x}{2x-1} < x$
13. $\frac{2+x}{1-3x} \geq 1$
14. $\frac{2-3x}{2+x} \leq 2$
15. $\frac{2}{2-3x} \geq x$
16. $\frac{x+2}{x-2} > x-1$
17. $\frac{1+x}{1-2x} > 1-x$
18. $\frac{2}{1-x} < \frac{1}{1+x}$
19. $\frac{2}{x-2} > \frac{1}{1-x}$
20. $\frac{x-2}{1-x} \leq x-2$
21. $\frac{2x+1}{x-2} + x \leq 1$
22. $\frac{x-1}{x+2} \leq \frac{x}{x-2}$
23. $\frac{2x-1}{2x+1} \leq \frac{x+1}{x-1}$
24. $\frac{2x-1}{2x+2} < x+1$
25. $\frac{1}{1+3x} \geq x+1$
26. $\frac{2x+1}{x+2} \geq x+1$
27. $\frac{1}{x-2} \geq \frac{1}{x-3}$
28. $\frac{x-1}{x-2} \geq \frac{x-2}{x-1}$
29. $\frac{1-2x}{x+1} \geq 2x-1$
30. $\frac{x-1}{x+1} - \frac{x}{x-2} > 1$
31. $\frac{x}{x-2} + \frac{x}{x+2} < 1$
32. $\frac{x}{x+2} - \frac{x+1}{x} \geq x$
33. $\frac{x-3}{x+3} - \frac{x-2}{x+2} \leq 1$
34. $\frac{x+1}{x-1} + \frac{x-2}{x+2} < 2$
35. $\frac{x}{x+1} - \frac{2}{x+2} \geq 1$
36. $\frac{1}{1-2x} - \frac{1}{1+2x} \leq x$

8. Determina los valores de x que hacen que la siguiente raíz sea real:

1. $\sqrt{2x-3}$
2. $\sqrt{1-2x}$
3. $\sqrt{x^2+2}$
4. $\sqrt{4-x^2}$
5. $\sqrt{x-2-x^2}$
6. $\sqrt{x^2+x+2}$
7. $\sqrt{4x-4-x^2}$
8. $\sqrt{x^2+4x+3}$
9. $\sqrt{2x^2-3x-2}$
10. $\sqrt{\frac{1}{2x-1}}$
11. $\sqrt{\frac{1}{2-x}}$
12. $\sqrt{\frac{2}{x^2-1}}$
13. $\sqrt{\frac{x-2}{2x-1}}$
14. $\sqrt{\frac{1+2x}{1-x}}$
15. $\sqrt{\frac{1}{x}+1}$
16. $\sqrt{\frac{x^2-1}{2-x}}$
17. $\sqrt{\frac{x-1}{4-x^2}}$
18. $\sqrt{\frac{x}{x+1}-1}$
19. $\sqrt{\frac{x}{x+1}-x}$
20. $\sqrt{x+\frac{x}{1-x}}$
21. $\sqrt{\frac{x}{x-1}-x}$

$$22. \sqrt{\frac{1}{x+2}} + x \quad 23. \sqrt{\frac{-2x}{x^2+1}} - 1 \quad 24. \sqrt{\frac{-1}{x^2-x-2}} \quad 25. \sqrt{\frac{x}{x-2}} - \frac{1}{x} \quad 26. \sqrt{x + \frac{2x+1}{x-2}} \quad 27. \sqrt{\frac{x}{x+1} + \frac{x}{x-1}} \quad 28. \sqrt{\frac{x^2-3x+2}{x^2+x+2}}$$

9. Halla el valor que debe tomar m para que la siguiente ecuación no tenga solución real:

$$\begin{array}{llllll} 1. mx^2-2x+1=0 & 2. mx^2+2x+3=0 & 3. 2mx^2+x-1=0 & 4. 3mx^2-3x+1=0 & 5. x^2+x+m=0 & 6. 3x^2-6x-m=0 \\ 7. x^2+2x-2m=0 & 8. x^2-6x-3m=0 & 9. x^2-mx+4=0 & 10. 3x^2+mx+3=0 & 11. 3x^2-2mx+3=0 & 12. x^2-2mx-3=0 \end{array}$$

— Soluciones —

$$\begin{array}{l} 1.1. \left(\frac{1}{2}, +\infty\right) \quad 1.2. \left(-\infty, \frac{2}{3}\right) \quad 1.3. [-4, +\infty) \quad 1.4. \left(-\infty, -\frac{1}{4}\right] \quad 1.5. (-1, +\infty) \quad 1.6. \left(-\infty, \frac{3}{2}\right) \quad 1.7. [2, +\infty) \quad 1.8. \left[-\frac{1}{2}, +\infty\right) \quad 1.9. (-\infty, +\infty) \quad 1.10. \left(-\infty, -\frac{1}{2}\right) \quad 1.11. [-2, +\infty) \quad 1.12. (-\infty, 2] \quad 1.13. \text{inc} \quad 1.14. \left(-\infty, -\frac{1}{4}\right) \quad 1.15. [1, +\infty) \quad 1.16. (-\infty, +\infty) \quad 1.17. \left(-\infty, -\frac{1}{2}\right) \quad 1.18. (1, +\infty) \quad 1.19. (-\infty, +\infty) \quad 1.20. \left(-\infty, -\frac{1}{4}\right] \quad 1.21. \left(\frac{2}{3}, +\infty\right) \quad 1.22. \text{inc} \quad 1.23. (-\infty, +\infty) \\ 1.24. (-\infty, +\infty) \quad 2.1. \left(\frac{4}{3}, +\infty\right) \quad 2.2. \left(\frac{1}{2}, +\infty\right) \quad 2.3. \left[\frac{4}{3}, +\infty\right) \quad 2.4. \left[\frac{4}{3}, +\infty\right) \quad 2.5. (-3, +\infty) \quad 2.6. (-\infty, 0) \quad 2.7. [1, +\infty) \quad 2.8. [2, +\infty) \quad 2.9. (0, +\infty) \quad 2.10. \left(\frac{1}{2}, +\infty\right) \quad 2.11. \left[-\frac{1}{4}, +\infty\right) \quad 2.12. \left(-\infty, -\frac{4}{3}\right] \quad 2.13. (-1, +\infty) \quad 2.14. \left(-\frac{1}{3}, +\infty\right) \quad 2.15. [1, +\infty) \quad 2.16. (-\infty, -4] \quad 2.17. (1, +\infty) \quad 2.18. \left(-\infty, \frac{1}{4}\right) \quad 2.19. \left[\frac{2}{3}, +\infty\right) \quad 2.20. [-2, +\infty) \quad 2.21. (-\infty, 1) \quad 2.22. \text{inc} \quad 2.23. [-1, +\infty) \quad 2.24. \left(-\infty, -\frac{1}{3}\right) \quad 2.25. (-\infty, +\infty) \quad 3.1. \left(\frac{-1}{3}, \frac{1}{2}\right) \quad 3.2. (-\infty, 0) \cup \left(\frac{3}{4}, +\infty\right) \quad 3.3. (-\infty, -1) \cup [0, +\infty) \quad 3.4. \left[-\frac{2}{3}, 2\right] \quad 3.5. \left(-\infty, -\frac{1}{2}\right) \cup \left(\frac{2}{3}, +\infty\right) \quad 3.6. \left(-\infty, -\frac{1}{2}\right) \cup \left(\frac{2}{3}, +\infty\right) \quad 3.7. \left(-\infty, -\frac{1}{2}\right) \cup [3, +\infty) \quad 3.8. \left[0, \frac{1}{3}\right] \quad 3.9. \left(0, \frac{3}{4}\right) \quad 3.10. \left(-\infty, -\frac{2}{3}\right) \cup \left(\frac{2}{3}, +\infty\right) \quad 3.11. (-\infty, +\infty) \quad 3.12. (-\infty, +\infty) \quad 3.13. \left(-2, \frac{1}{2}\right) \quad 3.14. \left(-\frac{3}{2}, 0\right) \quad 3.15. (-\infty, 0) \cup [1, +\infty) \quad 3.16. \text{inc} \quad 3.17. -3 \quad 3.18. \left(-\infty, \frac{1}{3}\right) \cup \left(\frac{1}{2}, +\infty\right) \quad 3.19. \left(\frac{-2}{3}, 1\right) \quad 3.20. \left(-\infty, \frac{1}{3}\right) \cup \left(\frac{1}{3}, +\infty\right) \quad 3.21. (-\infty, -3) \cup [1, +\infty) \quad 3.22. \text{inc} \quad 3.23. (-1, 0) \quad 3.24. (-\infty, -1) \cup (0, +\infty) \quad 3.25. \left(-\infty, -\frac{1}{3}\right) \cup \left(\frac{1}{3}, +\infty\right) \quad 3.26. (-\infty, +\infty) \quad 3.27. \left[-\frac{1}{2}, \frac{1}{2}\right] \quad 3.28. \left(-\infty, \frac{1}{4}\right) \cup (1, +\infty) \quad 3.29. -\frac{1}{3} \quad 3.30. 2 \quad 4.1. (-\infty, -1) \cup \left(-\frac{1}{3}, +\infty\right) \quad 4.2. (-\infty, -1) \cup (-1, +\infty) \quad 4.3. \left(-\infty, \frac{1}{2}\right) \cup [2, +\infty) \quad 4.4. \left[-\frac{3}{2}, -1\right] \quad 4.5. \left(-\frac{2}{3}, \frac{2}{3}\right) \quad 4.6. (0, 1) \quad 4.7. \left(-\infty, -\frac{2}{3}\right) \cup \left[-\frac{1}{3}, +\infty\right) \quad 4.8. \left(\frac{2}{3}, +\infty\right) \quad 4.9. (-\infty, -1) \cup (0, +\infty) \quad 4.10. \text{inc} \quad 4.11. (-\infty, +\infty) \quad 4.12. \text{inc} \quad 4.13. (-\infty, -2) \cup \left(\frac{1}{2}, +\infty\right) \quad 4.14. \left(-\frac{3}{4}, \frac{1}{3}\right) \quad 4.15. (-\infty, 0) \cup \left[\frac{1}{2}, +\infty\right) \quad 4.16. (-\infty, +\infty) \quad 4.17. (-\infty, +\infty) \quad 4.18. (-\infty, 1) \cup (1, +\infty) \quad 4.19. [-1, 1] \quad 4.20. \left(-\infty, -\frac{4}{3}\right) \cup \left[\frac{4}{3}, +\infty\right) \quad 4.21. \text{inc} \quad 4.22. (-4, 0) \quad 4.23. \left(-\infty, -\frac{4}{3}\right) \cup \left[\frac{3}{2}, +\infty\right) \quad 4.24. -2 \quad 5.1. (-\infty, 1) \quad 5.2. \left(-1, -\frac{2}{3}\right) \cup \left(\frac{1}{3}, +\infty\right) \quad 5.3. (-\infty, -2) \cup \left(-\frac{3}{2}, 1\right) \quad 5.4. [1, +\infty) \quad 5.5. (-\infty, 2) \quad 5.6. (-\infty, -1) \quad 5.7. (-\infty, -2) \cup \left[-1, \frac{3}{2}\right] \quad 5.8. \left(-2, -\frac{1}{3}\right) \cup \left(\frac{1}{2}, +\infty\right) \quad 5.9. [-1, +\infty) \quad 5.10. (2, +\infty) \quad 5.11. (-\infty, -2) \cup \{1\} \quad 5.12. \left[-2, -\frac{3}{2}\right] \cup [3, +\infty) \quad 5.13. (-1, +\infty) \quad 5.14. \left[-3, \frac{2}{3}\right] \cup [2, +\infty) \quad 5.15. \left[\frac{1}{2}, +\infty\right) \quad 5.16. \left(-\infty, \frac{1}{3}\right) \cup \left(\frac{2}{3}, 1\right) \quad 5.17. (-\infty, -3] \quad 5.18. (1, 2) \cup (2, +\infty) \quad 5.19. \left(-\infty, \frac{1}{2}\right) \cup \left[\frac{2}{3}, 2\right] \quad 5.20. [-2, +\infty) \quad 5.21. (-\infty, -1) \cup \left(-\frac{2}{3}, \frac{3}{2}\right) \quad 5.22. \left(-\infty, \frac{2}{3}\right) \cup [1, 2] \quad 5.23. \left(-\infty, -\frac{1}{2}\right) \quad 5.24. (-\infty, -1) \quad 6.1. (-\infty, 2) \quad 6.2. (-1, +\infty) \quad 6.3. (2, +\infty) \quad 6.4. \left(-\infty, \frac{3}{2}\right) \quad 6.5. \left(\frac{1}{2}, +\infty\right) \quad 6.6. \left(-\infty, \frac{1}{2}\right) \quad 6.7. \left(-\infty, -\frac{1}{2}\right) \quad 6.8. \left(\frac{3}{2}, +\infty\right) \quad 6.9. (-1, 2) \quad 6.10. \left(-\infty, -\frac{1}{2}\right) \cup (2, +\infty) \quad 6.11. \left(0, \frac{1}{2}\right) \quad 6.12. (-\infty, 1] \cup \left(\frac{3}{2}, +\infty\right) \quad 6.13. (-\infty, -1) \cup (1, +\infty) \quad 6.14. \left(-2, -\frac{1}{2}\right) \quad 6.15. \left(-\infty, -\frac{2}{3}\right) \cup \left[\frac{2}{3}, +\infty\right) \quad 6.16. \left[-\frac{1}{2}, \frac{1}{2}\right] \quad 6.17. (-1, 1) \quad 6.18. (-\infty, -2) \cup (2, +\infty) \quad 6.19. (-1, 2) \quad 6.20. (-\infty, -1) \cup (-1, +\infty) \quad 6.21. (-\infty, -3) \cup (-1, +\infty) \quad 6.22. (-2, 1) \quad 6.23. \left(-\infty, -\frac{1}{3}\right) \cup \left(\frac{1}{3}, +\infty\right) \quad 6.24. (1, 2) \quad 6.25. (-\infty, 0) \cup (0, 2) \quad 6.26. (-1, +\infty) \quad 6.27. \left(-\infty, \frac{1}{2}\right) \quad 6.28. (-1, +\infty) \quad 6.29. (-\infty, -2) \cup (-1, 1) \quad 6.30. (0, 1) \cup (2, +\infty) \quad 6.31. (-\infty, -2) \cup (0, 1) \quad 6.32. \left(-1, \frac{1}{2}\right) \cup (1, +\infty) \quad 6.33. (-\infty, -2) \cup (1, 2) \quad 6.34. (-1, 1) \cup (2, +\infty) \quad 6.35. [-2, 1] \cup (2, +\infty) \quad 6.36. \left(-1, \frac{1}{2}\right) \cup (3, +\infty) \quad 6.37. (-\infty, -2) \cup (-1, 2] \quad 6.38. \left(-\infty, -\frac{1}{2}\right) \cup (1, 2) \quad 6.39. (-\infty, -2) \cup \left[\frac{1}{2}, 2\right) \quad 6.40. \left(-1, -\frac{1}{2}\right) \cup [3, +\infty) \quad 6.41. (-\infty, -2) \cup [-1, 1] \cup (3, +\infty) \quad 6.42. (-\infty, -1) \cup (1, 2) \cup [3, +\infty) \quad 7.1. (-5, -1) \quad 7.2. (-1, 1) \cup (2, +\infty) \quad 7.3. (-\infty, -1) \cup (2, 3) \quad 7.4. (2, +\infty) \quad 7.5. (-\infty, 2) \quad 7.6. \left(-\infty, \frac{1}{2}\right) \cup (3, +\infty) \quad 7.7. \left(-\infty, -\frac{1}{3}\right) \cup \left(\frac{1}{2}, +\infty\right) \quad 7.8. (-\infty, 3) \cup [4, +\infty) \quad 7.9. \left(\frac{1}{2}, 2\right] \quad 7.10. \left(-\frac{1}{2}, 0\right) \quad 7.11. \left[-\frac{1}{2}, \frac{1}{2}\right] \cup [1, +\infty) \quad 7.12. \left(0, \frac{1}{2}\right) \cup (1, +\infty) \quad 7.13. \left[-\frac{1}{4}, \frac{1}{3}\right] \quad 7.14. (-\infty, -2) \cup \left[-\frac{2}{5}, +\infty\right) \quad 7.15. \left(-\infty, \frac{2}{3}\right) \quad 7.16. (-\infty, 0) \cup (2, 4) \quad 7.17. \left(0, \frac{1}{2}\right) \cup (2, +\infty) \quad 7.18. \left(-1, -\frac{1}{3}\right) \cup (1, +\infty) \quad 7.19. \left(1, \frac{4}{3}\right) \cup (2, +\infty) \quad 7.20. [0, 1] \cup [2, +\infty) \quad 7.21. (-\infty, 2) \quad 7.22. \left(-2, \frac{2}{5}\right) \cup (2, +\infty) \quad 7.23. \left(-\frac{1}{2}, 0\right] \cup (1, +\infty) \quad 7.24. (-1, +\infty) \quad 7.25. \left(-\infty, -\frac{4}{3}\right) \cup \left(-\frac{1}{3}, 0\right] \quad 7.26. (-\infty, -2) \quad 7.27. (2, 3) \quad 7.28. \left(1, \frac{3}{2}\right] \cup (2, +\infty) \quad 7.29. (-\infty, -2) \cup \left(-1, -\frac{1}{2}\right) \quad 7.30. (-4, -1) \cup (1, 2) \quad 7.31. (-2, 2) \quad 7.32. (-\infty, -2) \cup [-1, 0) \quad 7.33. (-\infty, -8] \cup (-3, -2) \cup [-1, +\infty) \quad 7.34. (-2, 1) \cup (4, +\infty) \quad 7.35. (-\infty, -2) \cup \left[-\frac{4}{3}, -1\right] \quad 7.36. \left(-\frac{1}{2}, 0\right] \cup \left(\frac{1}{2}, +\infty\right) \quad 8.1. \left[\frac{3}{2}, +\infty\right) \quad 8.2. \left(-\infty, \frac{1}{2}\right] \quad 8.3. (-\infty, +\infty) \quad 8.4. [-2, 2] \quad 8.5. \text{inc} \quad 8.6. (-\infty, +\infty) \quad 8.7. 2 \quad 8.8. (-\infty, -3] \cup [-1, +\infty) \quad 8.9. \left(-\infty, -\frac{1}{2}\right) \cup [2, +\infty) \quad 8.10. \left(\frac{1}{2}, +\infty\right) \quad 8.11. (-\infty, 2) \quad 8.12. (-\infty, -1) \cup (1, +\infty) \quad 8.13. \left(-\infty, \frac{1}{2}\right) \cup [2, +\infty) \quad 8.14. \left[-\frac{1}{2}, 1\right] \quad 8.15. (-\infty, -1) \cup (0, +\infty) \quad 8.16. (-\infty, -1] \cup [1, 2) \quad 8.17. (-\infty, -2) \cup [1, 2) \quad 8.18. (-\infty, -1) \quad 8.19. (-\infty, -1) \cup \{0\} \quad 8.20. [0, 1] \cup [2, +\infty) \quad 8.21. (-\infty, 0] \cup [1, 2] \quad 8.22. (-2, +\infty) \quad 8.23. -1 \quad 8.24. (-1, 2) \quad 8.25. (-\infty, -2] \cup (0, 1] \cup (2, +\infty) \quad 8.26. (2, +\infty) \quad 8.27. (-\infty, -1) \cup (1, +\infty) \cup \{0\} \quad 8.28. (-\infty, 1] \cup [2, +\infty) \quad 9.1. (1, +\infty) \quad 9.2. \left(\frac{1}{3}, +\infty\right) \quad 9.3. \left(-\infty, -\frac{1}{8}\right) \quad 9.4. \left(\frac{3}{4}, +\infty\right) \quad 9.5. \left(\frac{1}{4}, +\infty\right) \quad 9.6. (-\infty, -3) \quad 9.7. \left(-\infty, -\frac{1}{2}\right) \quad 9.8. (-\infty, -3) \quad 9.9. (-4, 4) \quad 9.10. (-6, 6) \quad 9.11. (-3, 3) \quad 9.12. \text{inc}$$