

ECUACIONES DE 1º GRADO

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|---|--------------|--|--------------|
| 1. $2x-34=-20$ | Sol: $x=7$ | 2. $9x+8=7x+6$ | Sol: $x=-1$ |
| 3. $4x+3=3x+5$ | Sol: $x=2$ | 4. $7x+9=3+9x$ | Sol: $x=3$ |
| 5. $x-8=2x-11$ | Sol: $x=3$ | 6. $x+1=2x-7$ | Sol: $x=8$ |
| 7. $6x+6=4+8x$ | Sol: $x=1$ | 8. $9+9x=17+5x$ | Sol: $x=2$ |
| 9. $2x+3=3x$ | Sol: $x=3$ | 10. $25-2x=3x+20$ | Sol: $x=1$ |
| 11. $4x+1=3x+3$ | Sol: $x=2$ | 12. $5x-3=10x-6$ | Sol: $x=3/5$ |
| 13. $1+8x=-16x+31$ | Sol: $x=5/4$ | 14. $5x-11=15x-19$ | Sol: $x=4/5$ |
| 15. $12x-48=-15x-30$ | Sol: $x=2/3$ | 16. $2x+17=3x+7$ | Sol: $x=10$ |
| 17. $10-5x=x-2$ | Sol: $x=2$ | 18. $70-3x=4x$ | Sol: |
| $x=10$ | | | |
| 19. $48-3x=5x$ | Sol: $x=6$ | 20. $-4x+30=-3x-10$ | Sol: $x=40$ |
| 21. $10x-15=4x+27$ | Sol: $x=7$ | 22. $x-3(x-2)=6x-2$ | Sol: $x=1$ |
| 23. $3x+1=6x-8$ | Sol: $x=3$ | 24. $3x-7=2(x+1)$ | Sol: $x=9$ |
| 25. $47-3x=5+11x$ | Sol: $x=3$ | 26. $2(2+4x)=3+12x$ | Sol: $x=1/4$ |
| 27. $30-9x=-7x+21$ | Sol: $x=9/2$ | 28. $5x=7(5x-3)+3$ | Sol: $x=3/5$ |
| 29. $3x-10=2x+1$ | Sol: $x=11$ | 30. $2(x-5)=3x-17$ | Sol: $x=7$ |
| 31. $25-2x=3x-35$ | Sol: $x=12$ | 32. $2+5(x-13)=x-3$ | Sol: $x=15$ |
| 33. $75-5x=3x+3$ | Sol: $x=9$ | 34. $2x-1=3(2x-15)$ | Sol: $x=11$ |
| 35. $5+8x=2x+20$ | Sol: $x=5/2$ | 36. $2(x-2)=-(4-x)$ | Sol: $x=0$ |
| 37. $2y-3=y+5$ | Sol: $y=8$ | 38. $2(3x-49)=-x+14$ | Sol: $x=16$ |
| 39. $2-6x=3x-1$ | Sol: $x=1/3$ | 40. $20=2x-(10-4x)$ | Sol: |
| $x=5$ | | | |
| 41. $60x-1=3(1+12x)$ | Sol: $x=1/6$ | 42. $5(x-1)+10(x+2)=45$ | Sol: $x=2$ |
| 43. $2x+3(2x-1)=x+67$ | Sol: $x=10$ | 44. $12x+3(2x-4)=60$ | Sol: $x=4$ |
| 45. $3-2x(5-2x)=4x^2+x-30$ | Sol: $x=3$ | 46. $3x-(x+1)=x-2$ | Sol: $x=-1$ |
| 47. $3[2x-(3x+1)]=x+1$ | Sol: $x=-1$ | 48. $x-3(x+5)=3x+10$ | Sol: |
| $x=-5$ | | | |
| 49. $(x-15)=3(x-19)$ | Sol: $x=21$ | 50. $3(2-x)=18x-1$ | Sol: $x=1/3$ |
| 51. $3(x+4)=4x+1$ | Sol: $x=11$ | 52. $10+5(x-3)=3(x+1)$ | Sol: $x=4$ |
| 53. $2(3-4x)=2x-9$ | Sol: $x=3/2$ | 54. $10-9x=4(x-4)$ | Sol: $x=2$ |
| 55. $2(3x+2)=4[2x-5(x-2)]$ | Sol: $x=2$ | 56. $15x=2(1+9x)-3$ | Sol: $x=1/3$ |
| 57. $3(12-x)-4x=2(11-x)+9x$ | Sol: $x=1$ | 58. $x+3=3(2x-4)$ | Sol: $x=3$ |
| 59. $\frac{3x}{2} + 2 = x + 4$ | | 60. $x - 8 = \frac{x}{2} - \frac{x-6}{3}$ | |
| 61. $x - \frac{3x}{4} = \frac{x}{7} + 3$ | | 62. $2 \left(\frac{x+5}{3} \right) = x + 3$ | |
| 63. $\frac{9x}{4} - 6 = \frac{2x}{3} + \frac{1}{3}$ | | 64. $\frac{5x}{6} - \frac{3x}{4} = x - 11$ | |
| 65. $\frac{3x}{5} - 7 = \frac{2x}{6} + 1$ | | 66. $x - 10 = \frac{5}{9} (x - 6)$ | |
| 67. $\frac{x}{3} + x = 10 + \frac{2x}{9}$ | | 68. $\frac{3x}{2} + 1 = 12 - \frac{x}{3}$ | |
| 69. $\frac{x}{5} + \frac{x}{2} = x - 3$ | | 70. $4x - 7 = \frac{5x - 6}{4}$ | |

$$71. \frac{x+2}{3} = 5x - 4$$

$$72. \frac{2x-10}{3x-20} = \frac{7}{8}$$

$$73. \frac{x}{4} + \frac{3x}{6} + x = 21$$

$$74. \frac{x}{4} - \frac{13}{6} = \frac{5x}{2} - \frac{5}{6}$$

$$75. \frac{x}{3} + \frac{x}{4} + \frac{x}{5} = 94$$

$$76. \frac{x}{3} + 10 = \frac{x}{5} + 16$$

$$77. \frac{x-7}{x+3} = \frac{10}{x+3} - 3$$

$$78. 3x - 9 + \frac{x}{5} = 2x - 3$$

$$79. \frac{\frac{3x}{5} - 12}{x+1} = 6$$

$$80. \frac{x}{4} + 5 = \frac{2x}{5} - 2 - \frac{x}{30}$$

$$81. \frac{3}{x+1} = \frac{x}{x-1} - 1$$

$$82. \frac{5x}{8} - 5(x-20) = \frac{-2x+18}{6}$$

$$83. x + \frac{x+1}{5} = x + \frac{x}{2}$$

$$84. 3x - \frac{7-x}{8} = -1 + \frac{x-3}{4} + 2x$$

$$85. 8 - \frac{3x}{10} + \frac{2x}{4} - \frac{5x}{8} = -9$$

$$86. \frac{x+1}{2} + \frac{3+x}{6} = 1 + \frac{x}{3}$$

$$87. \frac{3x}{5} - 2 + \frac{3x}{2} - \frac{x}{10} = 0$$

$$88. \frac{10}{x+5} + \frac{3+4x}{x+5} = 3$$

$$89. \frac{x+2}{x-1} - \frac{x+3}{x+1} = \frac{2x+2}{x^2-1}$$

$$90. \frac{7x-3}{6} - \frac{3x-1}{4} = \frac{5x-1}{4}$$

$$91. \frac{4x-3}{6} - \frac{3x-1}{4} = \frac{4x-2}{3} - 1$$

$$92. \frac{3(x+1)}{4} - \frac{x+3}{6} + x = 2x + \frac{3-7x}{12}$$

$$93. \frac{2x}{5} - 2 - \frac{x}{3} = \frac{x}{10} - 3$$

$$94. \frac{15}{x+10} - \frac{5}{x+2} = 0$$

$$95. \frac{2}{x+1} + \frac{3x-3}{x^2-1} = \frac{2}{x-1} + \frac{7}{x+1}$$

$$96. \frac{2x+1}{4} - \frac{3x}{9} - 2 = \frac{3x-2}{4}$$

$$97. \frac{5}{x-1} - \frac{3}{x+4} - \frac{3}{x^2+3x-4} = \frac{5}{x-1}$$

$$98. \frac{15}{x-2} - \frac{12x+6}{x^2-4} = \frac{18}{x+2}$$

$$99. (a+x)(b-x) - a(b+a) + x^2 + a^2 = \frac{b^2-ab}{a}$$

$$100. \frac{1}{x-a} + \frac{1}{x+a} = \frac{1}{x^2-a^2}$$

$$101. \frac{x}{2a} - 2 = \frac{1+x}{2}$$

$$102. \frac{1 + \frac{x+1}{x-1}}{2 - \frac{x-1}{x+1}} = 2$$

$$103. \frac{x}{3} + \frac{x-5}{2} - \frac{1}{4}x = \frac{5x-2}{2}$$

$$104. \frac{x-3}{3} - \frac{3(x-2)}{2} = \frac{x-3-(x+2)}{2}$$

$$105. \frac{x-3}{5} - \frac{x-3}{2} = \frac{x-3}{3} - \frac{x+3}{2}$$

$$106. \frac{x+1}{2} + \frac{5+x}{6} = 1 + \frac{9-2x}{3}$$

$$107. x(x-2) - \frac{x+2}{3} - \frac{x-2}{2} = (x-2)^2 - 4$$

$$108. x(x-2) - \frac{x+2}{3} - \frac{x-2}{2} = (x-2)^2 - 4x$$

$$109. \frac{x^2-2x+1}{x(x+1)(x-1)} = \frac{3}{2x}$$

Sol: 59. $x=4$; 60. $x=12$; 61. $x=28$; 62. $x=1$; 63. $x=4$; 64. $x=12$; 65. $x=30$; 66. $x=15$; 67. $x=9$; 68. $x=6$; 69. $x=10$; 70. $x=2$; 71. $x=1$; 72. $x=12$; 73. $x=12$; 74. $x=-16/27$; 75. $x=120$; 76. $x=45$; 77. $x=2$; 78. $x=5$; 79. $x=5$; 80. $x=60$; 81. $x=2$; 82. $x=24$; 83. $x=2/3$; 84. $x=-1$; 85. $x=40$; 86. $x=0$; 87. $x=1$; 88. $x=2$; 89. $x=3$; 90. $x=0$; 91. $x=1$; 92. $x=0$; 93. $x=30$; 94. $x=2$; 95. $x=0$; 96. $x=-15/7$; 97. $x=0$; 98. $x=4$; 99. $x=b/a$; 100. $x=1/2$; 101. $x=5a/(1-a)$; 102. $x=3$; 103. $x=-18/23$; 104. $x=27/7$; 105. $x=51/2$; 106. $x=2$; 107. $x=-2/7$; 108. $x=22/31$; 109. $x=-5$

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ECUACIONES DE 2º GRADO

110. $x^2 - 7x + 12 = 0$ Sol: $x = 3; x = 4$ 111. $x^2 - 9x + 18 = 0$ Sol: $x = 3; x = 6$
 112. $x^2 - 5x + 6 = 0$ Sol: $x = 2; x = 3$ 113. $x^2 + 8x + 15 = 0$ Sol: $x = -5; x = -3$
 114. $x^2 - 6x - 27 = 0$ Sol: $x = -3; x = 9$ 115. $x^2 - 6x + 9 = 0$ Sol: $x = 3$
 116. $x^2 + 6x = -9$ Sol: $x = -3$ 117. $4x^2 + 4x = 3$ Sol: $x = 1/2; x = -3/2$
 118. $x^2 - 9x + 14 = 0$ Sol: $x = 2; x = 7$ 119. $x^2 - 6x + 8 = 0$ Sol: $x = 4; x = 2$
 120. $2x^2 + 10x - 48 = 0$ Sol: $x = 3; x = -8$ 121. $x^2 - x = 20$ Sol: $x = -4; x = 5$
 122. $x^2 = 5x + 6$ Sol: $x = 6; x = -1$ 123. $2x^2 - 5x + 3 = 0$ Sol: $x = 1; x = 3/2$
 124. $x^2 + 10x + 25 = 0$ Sol: $x = -5$ 125. $x^2 + 9 = 10x$ Sol: $x = 1; x = 9$
 126. $3x^2 - 39x + 108 = 0$ Sol: $x = 4; x = 9$ 127. $2x^2 - 9x + 9 = 0$ Sol: $x = 3; x = 3/2$
 128. $3x^2 + 2x = 8$ Sol: $x = -2; x = 4/3$ 129. $4x^2 + 12x + 9 = 0$ Sol: $x = -3/2$
 130. $5x^2 + 1 = 6x$ Sol: $x = 1; x = 1/5$ 131. $6x^2 + 1 = 5x$ Sol: $x = 1/2; x = 1/3$
 132. $6x^2 - 6 = 5x$ Sol: $x = -2/3; x = 3/2$ 133. $2x^2 + 7x + 6 = 0$ Sol: $x = -2; x = -3/2$
 134. $x^2 = 2x + 3$ Sol: $x = -1; x = 3$ 135. $4x^2 + 3 = 8x$ Sol: $x = 1/2; x = 3/2$
 136. $x^2 - x + 1/4 = 0$ Sol: $x = 1/2$ 137. $3x^2 - 16x + 5 = 0$ Sol: $x = 5; x = 1/3$
138. $1 - \frac{x^2}{3} - \frac{3x+2}{3} = 1$ 139. $\frac{(x-3)^2}{2} - x + x^2 = x - (x-2)$
 140. $\frac{1}{x-1} + 3x + 3x^2 - 2 = \frac{3}{x-1} + 3x^2$ 141. $(x-3)^2 - \frac{x-1}{3} = 2x$
 142. $\frac{x-3}{3} - \frac{1}{x-1} = 3x$ 143. $x - \frac{2}{x} + \frac{1}{2x} = 5x + 5$
 144. $\frac{x-3}{x} + 3x - \frac{5}{x} = 2x - \frac{3}{x} - 3$ 145. $3x - \frac{8}{x} + (x-1)^2 = 3(x-2) - (x-5)$
 146. $(x-3)(x-2) + \frac{x(x-3)}{2} = (x-2)^2$
 147. $(x-2)x - \frac{x+2}{3} - \frac{(x-2)(x+2)}{2} = (x-2)^2 - 4$
 148. $(x-3)^2 - \frac{x-2}{3} + (3-x)(x-1) = (x-2)^2$
 149. $\frac{x-1}{x+1} - \frac{3+x}{x} = 2$ 150. $\frac{x-1}{x+1} - \frac{3+x}{x-1} = 2$
 151. $x + \frac{1}{x-2} = 4$ 152. $x^2 - x = \frac{2}{9} - \frac{2x}{3}$
 153. $\frac{x^2}{3} + 2 = \frac{5x}{3}$ 154. $x + \frac{2}{x} = 3$
 155. $x - 2 = \frac{4x-8}{x}$ 156. $\frac{x}{2} + \frac{3}{x} = \frac{2x+9}{x}$
 157. $2x - 2 = \frac{6x}{x-1} - 5$ 158. $x(x+1) - \left(x + \frac{x}{2}\right) = 0$

$$159. 3x + 1 - \frac{3}{x} = \frac{1+3x}{4}$$

$$161. x + \frac{1}{x} = \frac{6}{3x}$$

$$163. \frac{x}{3} + \frac{2}{x} = \frac{3x+10}{3x}$$

$$165. \frac{3}{x + \frac{1}{2 + \frac{x+1}{x-2}}} = \frac{1}{x}$$

$$160. 2 + \frac{x+4}{3} = \frac{4x+4}{3} + \frac{2-x}{x-3}$$

$$162. x - 2 = \frac{2x-3}{x}$$

$$164. x + 3 = \frac{2x+1}{x-1}$$

$$166. \frac{\frac{x-3}{2} - \frac{x-3}{4}}{x - \frac{1}{1 - \frac{x-1}{x+1}}} = -\frac{1}{x}$$

Soluciones: 138. $x = -2, x = -1$; 139. $x = 1, x = 5/3$; 140. $x = 5/3, x = 0$; 141. $x = 4/3, x = 7$; 142. $x = 5/8, x = 0$; 143. $x = -3/4, x = -1/2$; 144. $x = -5, x = 1$; 145. $x = -2, x = 2$; 146. $x = 1, x = 4$; 147. $x = -2/3, x = 4$; 148. $x = -1, x = 8/3$; 149. $x = -3, x = -1/2$; 150. $x = -3, x = 0$; 151. $x = 3$; 152. $x = -1/3, x = 2/3$; 153. $x = 2, x = 3$; 154. $x = 1, x = 2$; 155. $x = 4, x = 2$; 156. $x = -2, x = 6$; 157. $x = -1/2, x = 3$; 158. $x = 0, x = 1/2$; 159. $x = 1, x = -4/3$; 160. $x = 2, x = 4$; 161. $x = 1, x = -1$; 162. $x = 3, x = 1$; 163. $x = -1, x = 4$; 164. $x = -2, x = 2$; 165. $x = 1/2, x = 2/3$; 166. $x = -1; x = 2$

ECUACIONES IRRACIONALES

$$\begin{array}{lll}
 1. x + \sqrt{x} = 30 & 2. \sqrt{x} + 1 = \sqrt{x+9} & 3. \sqrt{7-3x} - x = 7 \\
 4. \sqrt{x+4} = 3 - \sqrt{x-1} & 5. 5\sqrt{x} + 3 = 2x & 6. 3\sqrt{6x+1} - 5 = 2x \\
 7. \sqrt{4x+5} - \sqrt{3x+1} = 1 & 8. \sqrt{2x-1} + \sqrt{x+4} = 6 & 9. 1 + \sqrt{x+1} = \frac{x}{3} \\
 10. \sqrt{x^3} - 2\sqrt{x} = \sqrt{x} & 11. \sqrt{x-3} + \sqrt{x+4} = \sqrt{4x+1} & \\
 12. 2\sqrt{x+4} = \sqrt{5x+4} & 13. \sqrt{x^2+3x+7} = 5 & 14. 3 - \sqrt{x} = x + 1 \\
 15. 2\sqrt{2x-1} = \sqrt{6x-5} + \sqrt{2x-9} & 16. \sqrt{2x+5} + 6 = 3x + 3 & \\
 17. \sqrt{3x+10} = 1 + \sqrt{3x+3} & 18. \sqrt{3x-2} - 4 = 0 & 19. \sqrt{2x+1} = x - 1 \\
 20. \sqrt{2x-1} + \sqrt{2x+1} = \frac{1}{\sqrt{2x-1}} & 21. \frac{21}{\sqrt{6x+1}} - \sqrt{6x+1} = 2\sqrt{3x} & \\
 22. \frac{3}{\sqrt{x}} = \frac{6}{\sqrt{3x+4}} & 23. \sqrt{2} + \sqrt{\frac{2^3}{x}} = \sqrt{2x} & \\
 24. \sqrt{x+6} + \sqrt{x+11} = \sqrt{5-10x} & 25. \sqrt{9}\sqrt{15-x} = 6\sqrt{2x+3} &
 \end{array}$$

Soluciones:

$$\begin{array}{llll}
 1. x=25, x=36; & 2. x=16; & 3. x=-3, x=-14; & 4. x=13/9; \\
 5. x=9, x=1/4; & 6. x=8, x=1/2; & 7. x=5, x=1; & 8. x=5, x=221; \\
 9. x=15, x=0; & 10. x=0, x="3; & 11. x=12; & 12. x=12; \\
 13. x=3, x=-6; & 14. x=1, x=4; & 15. x=5; & 16. x=2/9, x=2; \\
 17. x=2; & 18. x=6; & 19. x=4, x=0; & 20. x=5/8; \\
 21. x=4/3; & 22. x=4; & 23. x=4, x=1; & 24. x=-2, x=3/7; \\
 25. x=-1 & & &
 \end{array}$$

ECUACIONES BICUADRADAS Y BICÚBICAS

$$\begin{array}{lll}
 1. x^4 - 5x^2 + 4 = 0 & 2. x^4 + 2x^2 - 3 = 0 & 3. x^6 - 9x^3 + 8 = 0 \\
 4. x^6 - 26x^3 - 27 = 0 & 5. 6x^4 + 2x^2 - 8 = 0 & 6. x^4 - 4x^2 = 0 \\
 7. 4x^4 - 17x^2 + 4 = 0 & 8. 9x^4 - 3x^2 + 4 = 0 & 9. x^4 - 6x^2 - 27 = 0 \\
 10. x^6 + 7x^3 - 8 = 0 & 11. x^4 - 2x^2 - 8 = 0 & 12. x^6 + 28x^3 + 27 = 0
 \end{array}$$

Soluciones:

$$\begin{array}{llll}
 1. x="1, x="2; & 2. x="1; & 3. x=2, x=1; & 4. x=-1, x=3; \\
 5. x="1; & 6. x=0, x="2; & 7. x="2, x="1/2 & 8. x="1/3, x="2 \\
 9. x="3 & 10. x=1, x=-2 & 11. x="2 & 12. x=-1, x=-3
 \end{array}$$