UNIVERSIDAD DEL BÍO-BÍO
FACULTAD DE CIENCIAS
DEPARTAMENTO DE MATEMÁTICA
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Segundo Semestre 2022

Guía N°1
Ecuaciones con una incógnita
Cálculo I (220157)

Resuelva las siguientes ecuaciones.

1. $10x - 1 = 15 - 6x$
2. $\frac{3x}{2} + 5 = \frac{5x}{2} - 1$
3. $9x - 8 = 11x - 10$
4. $\frac{x}{2} + \frac{x}{3} = 5$
5. $7 + \frac{x}{3} = 8 + \frac{x}{4}$
6. $x - \frac{2}{3} = \frac{5x}{7} + \frac{1}{2}$
7. $2x - \frac{x}{2} + 4 = x + \frac{x}{3}$
8. $-\frac{17}{19}x + 51 = 0$
9. $3 - y + \frac{5y}{6} = \frac{1}{2} - \frac{y}{8}$
10. $(6x - 5)(x - 2) - (3x - 1)(2x - 3) = 4$
11. $(x + 2)(x - 2) - (x - 3)^2 = -1$
12. $x - 4(x - 2(x + 6)) = 5x + 3$
13. $\frac{3x-1}{5} - \frac{5x+1}{6} = \frac{x+1}{8} - 3$
14. $\frac{1-7x}{8} - \frac{x+30}{3} - \frac{x-1}{5} = 3$
15. $\frac{4x+1}{3} - \frac{3x-1}{5} = 15 - \frac{25-x}{4}$
16. $(x - 3)(x + 4) - 2(3x - 2) = (x - 4)^2$
17. $(x + 5)(x + 2) - 3(4x - 3) = (x - 5)^2$

Respuestas:

1. $x = 1$
2. $x = 6$
3. $x = 1$
4. $x = 6$
5. $x = 12$
6. $x = \frac{49}{12}$
7. $x = -24$
8. $x = 57$
9. $y = 60$
10. $x = \frac{1}{2}$
11. $x = 2$
12. $x = \phi$
13. $x = 7$
14. $x = -9$
15. $x = 17$
16. $x = 8$
17. $x = \frac{6}{5}$

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9. $3 - y + \frac{5y}{6} = \frac{1}{2} - \frac{y}{8}$

1) $10x - 1 = 15 - 6x$

$10x + 6x = 15 + 1$

$16x = 16$

$x = 16/16$

$x = 1$

2) $\frac{3x}{2} + 5 = \frac{5x}{2} - 1$

$\frac{3x}{2} - \frac{5x}{2} = -1 - 5$

$\frac{-2x}{2} = -6$

$-x = -6 \quad / \cdot -1$

$x = 6$

3) $9x - 8 = 11x - 10$

$9x - 11x = 8 - 10$

$-2x = -2$

$x = \frac{-2}{-2}$

$x = 1$

4) $\frac{x}{2} + \frac{x}{3} = 5$

$\frac{3x + 2x}{6} = 5$

$\frac{5x}{6} = 5$

$5x = 5 \cdot 6$

$x = \frac{30}{5}$

$x = 6$

5) $7 + \frac{x}{3} = 8 + \frac{x}{4}$

$\frac{x}{3} - \frac{x}{4} = 8 - 7$

$\frac{4x - 3x}{12} = 1$

$\frac{x}{12} = 1$

$x = 1 \cdot 12$

$x = 12$

6) $x - \frac{2}{3} = \frac{5x}{7} + \frac{1}{2}$

$x - \frac{5x}{7} = \frac{2}{3} + \frac{1}{2}$

$\frac{7x - 5x}{7} = \frac{4 + 3}{6}$

$\frac{2x}{7} = \frac{7}{6}$

$2x = \frac{7}{6} \cdot \frac{7}{1}$

$x = \frac{49}{6} \cdot \frac{1}{2}$

$x = \frac{49}{12}$

7) $2x - \frac{x}{2} + 4 = x + \frac{x}{3} \quad / \cdot 6$

$12x - 3x + 24 = 6x + 2x$

$9x - 8x = -24$

$-x = -24$

8. $-\frac{17}{19}x + 51 = 0$

$-\frac{17}{19}x = -51$

$-17x = -969$

$x = \frac{-969}{-17}$

$x = 57$

9. $3 - y + \frac{5y}{6} = \frac{1}{2} - \frac{y}{8} \quad / \cdot 24$

$\frac{-y}{1} + \frac{5y}{6} + \frac{y}{8} = \frac{-3}{1} + \frac{1}{2}$

$\frac{-24y + 20y + 3y}{24} = \frac{-5}{2}$

$\frac{-y}{24} = \frac{-5}{2} \cdot \frac{24}{1}$

$-y = \frac{-120}{2} \quad / \cdot -1$

$y = 60$

10. $(6x-5)(x-2)-(3x-1)(2x-3)=4$

$(6x^2-12x-5x+10)-(6x^2-9x-2x+3)=4$

$(6x^2-17x+10)-(6x^2-11x+3)=4$

$6x^2-17x+10-6x^2+11x-3=4$

$-6x+7=4$

$-6x=4-7$

$-6x=-3$

$x=\frac{-3}{-6}$

$x=\frac{1}{2}$

11. $(x+2)(x-2)-(x-3)^2=-1$

$x^2-4-(x-3)(x-3)=-1$

$x^2-4-(x^2-3x-3x+9)=-1$

$x^2-4-x^2+3x+3x+9=-1$

$5+6x=-1$

$6x=-1-5$

$x=\frac{-6}{6}$

$x=-1$

12. $x-4(x-2(x+6))=5x+3$

$x-4(x-2x-12)$

$x-4x+8x+48=5x+3$

$5x-5x=3-48$

$0=45$

Por tanto $\emptyset$

13. $\frac{3x-1}{5}-\frac{5x+1}{6}=\frac{x+1}{8}-3 \quad /\cdot 120$

$72x-24-100x-20=15x+15-360$

$-28x-44=15x-345$

$-28-15x=-345+44$

$-43x=-301$

$x=\frac{-301}{-43}$

$x=7$

14. $\frac{1-7x}{8}-\frac{x+30}{3}-\frac{x-1}{5}=3 \quad /\cdot 120$

$15-105x-40x-1200-24x+24=360$

$-169x-1161=360$

$-169x=360+1161$

$x=\frac{1521}{-169}$

$x=-9$

15. $\frac{4x+1}{3}-\frac{3x-1}{5}=15-\frac{25-x}{4} \quad /\cdot 60$

$80x+20-36x+12=900-375+15x$

$80x-36x-15x=900-375-12-20$

$29x=493$

$x=\frac{493}{29}$

$x=17$

16. $(x-3)(x+4)-2(3x-2)=(x-4)^2$

$x^2+4x-3x-12-6x+4=(x+4)(x-4)$

$x^2+4x-3x-12-6x+4=x^2-8x+16$

$-5x-8=-8x+16$

$-5x+8x=16+8$

$3x=24$

$x=\frac{24}{3}$

$x=8$

17. $(x+5)(x+2)-3(4x-3)=(x-5)^2$

$x^2+2x+5x+10-12x+9=x^2-10x+25$

$-5x+19=-10x+25$

$-5x+10x=25-19$

$5x=6$

$x=\frac{6}{5}$