

Guía N° 19
Ejercicios de racionales algebraicos

I.- Simplificar las fracciones algebraicas:

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

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

3.- $\frac{x^2 - 5x + 6}{x^2 - 7x + 12} =$

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

5.- $\frac{x^3 - 19x - 30}{x^3 - 3x^2 - 10x} =$

II.- Resolver simplificando al máximo:

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

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

8.- $\frac{x^2-2x}{x^2-5x+6} \cdot \frac{x^2+4x+4}{x^2-4} =$

9.- $\frac{9-6x+x^2}{9-x^2} \cdot \frac{x^2-5x+6}{3x^2-9x} =$

10.- $\frac{x+2}{x^2+4x+4} \cdot \frac{x^2-4}{x^3+8} =$

11.- $\frac{x^3+3x^2-4x-12}{x^2+2x-3} \cdot \frac{4x-2x^2}{x^3-2x^2+x} =$

12.- $\left(x + \frac{x}{x-1}\right) \cdot \left(x - \frac{x}{x-1}\right) =$

13.- $\left(x + \frac{x}{x-1}\right) : \left(x - \frac{x}{x-1}\right) =$

14.- $\frac{x}{1 + \frac{1}{1 + \frac{1}{x}}} =$

Resolver Simplificando al máximo:

$$\begin{array}{llll}
 1. \frac{a}{2} : \frac{a}{3} & 5. \frac{2ab}{3b} : \frac{6a}{2ab} & 9. \frac{15n^2p}{2nz} : \frac{3np^2}{4z} & 13. \frac{15a^3bc}{3ab^2} : \frac{25a^2b^2c^2}{bc} \\
 2. \frac{1}{a} : \frac{2}{a} & 6. \frac{x-1}{5} : \frac{x-1}{10} & 10. \frac{a^2-1}{a+2} : \frac{a-1}{a+2} & 14. \frac{x^3-x^2y}{2xy} : \frac{x^2-y^2}{x+y} \\
 3. \frac{x^2}{y} : \frac{x}{y} & 7. \frac{2axy}{3a} : \frac{2x}{3y} & 11. \frac{x-1}{a-1} : \frac{x^2-x}{a^2-a} & 15. \frac{2ab}{8b^2} : \left(\frac{2x}{x-1} : \frac{3bx}{2x-2} \right) \\
 4. \frac{m}{ax} : \frac{n}{ax} & 8. \frac{a+b}{a-b} : (a^2-b^2) & 12. \frac{a^2-b^2}{a^3-b^3} : \frac{a+b}{a-b} & 16. \frac{2x-6}{3x^2y} : \frac{x^2-5x+6}{6xy}
 \end{array}$$

$$\begin{array}{ll}
 17. \frac{1}{a^2-49} : \frac{1}{a^2-8a+7} & 24. \frac{1}{x} : \left(\frac{1}{x} : \frac{1}{x} \right) \\
 18. \left(\frac{1}{a} : \frac{2}{a^2} \right) : \frac{a}{2} & 25. \left(\frac{22x^2y}{7} : \frac{11xy}{14} \right) : 2x \\
 19. \frac{a-1}{a-2} : \frac{a^2-1}{a^2-4} & 26. \frac{a^3+3a^2}{a^2-9} : \frac{a^2+2a}{a^2-5a+6} \\
 20. \frac{a-3}{a-5} : \frac{a^2-8a+15}{a^2-11a+30} & 27. \frac{1}{x^3-6x^2} : \frac{1}{x^2-12x+36} \\
 21. \frac{2a+8}{3a-3} : \frac{a^2+2a-8}{6a^2-6} & 28. \frac{ac-ad-bc+bd}{a^2-b^2} : \frac{c^2-d^2}{a^2+2ab+b^2} \\
 22. \frac{a^3-5a^2+6a}{a^2+7a+12} : \frac{a^3-3a^2}{a^2-16} & 29. \left(\frac{x^2+7x+10}{x^2+2x-3} : \frac{x+2}{x+3} \right) \cdot \frac{x^2+3x-4}{x^2-25} \\
 23. \frac{a}{b^2} : \frac{a^2}{b} & 30. \frac{2x}{x-2} \cdot \left(\frac{x^2-4}{x^2+x} : \frac{x+2}{x^2-1} \right)
 \end{array}$$

Respuestas:

$$\begin{array}{llllll}
 1. \frac{3}{2} & 2. \frac{1}{2} & 3. x & 4. \frac{m}{n} & 5. \frac{2ab}{9} & 6. 2 & 7. y^2 \\
 8. \frac{1}{a^2-2ab+b^2} & 9. \frac{10}{p} & 10. a+1 & 11. \frac{a}{x} & 12. \frac{a-b}{a^2+ab+b^2} & 13. \frac{1}{5b^2} \\
 14. \frac{x}{2y} & 15. \frac{3a}{16} & 16. \frac{4}{x^2-2x} & 17. \frac{a-1}{a+7} & 18. 1 & 19. \frac{a+2}{a+1} \\
 20. \frac{a-6}{a-5} & 21. \frac{4a+4}{a-2} & 22. \frac{a^2-6a+8}{a^2+3a} & 23. \frac{1}{ab} & 24. \frac{1}{x} & 25. 2 \\
 26. \frac{a^2-2a}{a+2} & 27. \frac{x-6}{x^2} & 28. \frac{a+b}{c+d} & 29. \frac{x+4}{x-5} & 30. 2x-2
 \end{array}$$

Resolver las operaciones simplificando al máximo

$$\frac{2a+b}{3a} - \frac{2a-b}{3b} - \frac{a}{b}$$

$$\frac{2a-1}{3(a-2)} - \frac{2a-2}{a^2-4} - \frac{a}{3}$$

$$\frac{2x}{x+y} - \frac{3x-y}{x-y} + \frac{2x-4y}{x^2-2xy+y^2}$$

$$\frac{a+7}{a-6} - \frac{a-6}{a-5} + \frac{2a-4}{a^2-25}$$

$$\frac{2x}{x^2+3x+2} - \frac{x+4}{x^2-4} + \frac{2x-3}{x^2-x-2}$$

$$\frac{2}{x^2+7x+12} + \frac{1}{x^2-16} - \frac{3}{x^2-9}$$

$$\frac{x-4}{3x^2+12x} - \frac{2x-4}{x^2+x-12} - \frac{4-2x}{2x^2-6x}$$

$$\frac{3x}{3x^2+15x} + \frac{4x}{x^2+8x+15} + \frac{2x^2-3x}{3x^2+9x}$$