

GUIA DE ALGEBRA

I. Simplifica cada una de las siguientes fracciones algebraicas

(1) $\frac{15a^3b^2}{20ab^4}$	(2) $\frac{7mn^4p^5}{21m^3np^7}$
(3) $\frac{121a^4c^5d^7}{11ac^5d^8}$	(4) $\frac{8a - 16b}{24}$
(5) $\frac{42}{18a + 24b}$	(6) $\frac{14x + 21y}{50x + 75y}$
(7) $\frac{27m - 36n}{36m - 48n}$	(8) $\frac{x^2 - x}{xy - x}$
(9) $\frac{a^2 + 2ab + b^2}{3a + 3b}$	(10) $\frac{m^2 - n^2}{m^2 + 2mn + n^2}$
(11) $\frac{x^2 - 5x + 6}{x^2 - 2x}$	(12) $\frac{a^3 - b^3}{a^2 - b^2}$
(13) $\frac{3x^2 - 27x + 42}{5x^2 - 15x - 140}$	(14) $\frac{4p + 2q}{8p^2 + 8pq + 2q^2}$
(15) $\frac{m^4n - m^2n^3}{m^3n + m^2n^2}$	(16) $\frac{x^3 + 3x^2 - 10x}{x^3 - 4x^2 + 4x}$
(17) $\frac{(8p^3q^2)^4}{(16p^2q^2)^3}$	(18) $\frac{(12mn^3)^3}{(18m^2n)^4}$
(19) $\frac{16a^2 + 56ab - 32b^2}{2a^2 + 5ab - 3b^2}$	(20) $\frac{ac - ad + bc - bd}{2c + 3bc - 2d - 3bd}$
(21) $\frac{5am^2x - 5an^2x}{5am^2x - 10amnx + 5an^2x}$	(22) $\frac{x^4 - 1}{3x^2 - 3}$
(23) $\frac{m^3 - n^3}{5m^2 + 5mn + 5n^2}$	(24) $\frac{16x^2y - 25y}{4x^2y - 3xy - 10y}$
(25) $\frac{2xa - 4xb}{3ya - 6yb}$	(26) $\frac{x(x-3)^2(x-1)}{x^2(x-5)^3(x-1)^2}$
(27) $\frac{(x-1)^3(x-5)^4}{x^2(x-5)^3(x-1)^2}$	(28) $\frac{a^2 - ab}{a^4 - a^2b^2}$

II. Calcula la adición o sustracción de las siguientes fracciones algebraicas y simplifica cuando proceda

(1) $\frac{9}{x} + \frac{5}{x} - \frac{7}{x}$	(2) $\frac{4}{a^2} - \frac{5}{a^2} - \frac{9}{a^2}$
(3) $\frac{6x}{3x-2} - \frac{4}{3x-2}$	(4) $\frac{4m}{2m+5} + \frac{5m+6}{2m+5} - \frac{7m+8}{2m+5}$
(5) $\frac{2x-3}{2x+15} + \frac{7x+8}{2x+15}$	(6) $\frac{7}{a^2-3a-4} + \frac{2a-5}{a^2-3a-4}$
(7) $\frac{12-m^2}{m^2+m-12} - \frac{-3m-m^2}{m^2+m-12}$	(8) $\frac{15p^2}{9p^2-4} - \frac{6p+6p^2}{9p^2-4}$
(9) $\frac{a^2}{a-2} + 1 - \frac{a-8}{a-2}$	(10) $\frac{a+3}{a-2} + \frac{9}{a-2} + 1$
(11) $\frac{a-5}{a+5} - 1 - \frac{7}{a+5}$	(12) $\frac{a+4}{3a-2} - \frac{5a+3}{3a-2} - 1$
(13) $\frac{5m-8n}{3m-2n} + \frac{7m+9n}{2n-3m} - \frac{5m-15n}{2n-3m}$	(14) $\frac{3p-12p^2}{20p^2+7p-6} + \frac{p^2+10p}{20p^2+7p-6}$
(15) $\frac{6a-a^2}{3a^2+10a^{-8}} - \frac{a+10}{3a^2+10a^{-8}} + \frac{3a^2-2}{3a^2+10a^{-8}}$	(16) $\frac{b^2-2b}{4b^4-13b^2+3} - \frac{3b}{4b^4-13b^2+3}$
(17) $\frac{a-b}{x-y} - \frac{3a-2b}{y-x} + \frac{5a-8b}{x-y}$	(18) $\frac{m-4}{m^2+2m-3} - \frac{m^2-3m}{m^2+2m-3} + \frac{7+2m^2}{m^2+2m-3}$

III. Calcula la adición o sustracción y simplifica cuando proceda

(1) $\frac{9}{5x} - \frac{5}{2x} + \frac{3}{x}$	(2) $\frac{6}{x^2} + \frac{7}{2x} - \frac{5}{3x}$
(3) $\frac{m-2}{2m} + \frac{3m-1}{5m}$	(4) $\frac{x+6}{8x} - \frac{2x+5}{12x}$
(5) $m-2 - \frac{5}{m+1}$	(6) $\frac{7}{2a-3} + a+1$
(7) $b+1 + \frac{5}{3b+1}$	(8) $\frac{9c}{c-3} - c+4$
(9) $\frac{2}{a^2-1} + \frac{3a}{a^2-a-2}$	(10) $\frac{m}{m+4} + \frac{7m}{m^2+m-12}$

(11) $\frac{p+1}{p^2+p-12} - \frac{2}{p^2+5p-24}$	(12) $\frac{x}{x-2y} - \frac{2xy}{x^2-2xy} + \frac{y}{x}$
(13) $\frac{d+1}{d-3} + \frac{d}{d+3} - \frac{6(d+1)}{d^2-9}$	(14) $\frac{2x}{y} - \frac{x^2}{xy+y^2} - \frac{y}{x+y}$
(15) $\frac{2a+3b}{3a-2b} - \frac{3a+2b}{3b-2a}$	(16) $\frac{4}{m^2-1} + \frac{2}{m-1} + \frac{m}{m+1}$
(17) $\frac{6z+1}{2z^2+5z-3} - \frac{3}{z+3}$	(18) $\frac{2}{x^2+10x+24} + \frac{9}{18-3x-x^2} + \frac{4x-5}{x^2+x-12}$
(19) $\frac{2a+5}{a^2-a-2} - \frac{1}{a+3} + \frac{2a+4}{a^2+4a+3}$	(20) $\frac{3m+1}{m^2+2m-3} - \frac{m-11}{m^2+2m-3} - \frac{1}{m-1}$
(21) $\frac{p+17}{p^2-p-12} + \frac{p+1}{p^2+5p+6} - \frac{6}{p^2-2p-8}$	(22) $\frac{3d}{2d^2+d-1} + \frac{7}{6d^2+d-2} + \frac{1}{3d^2+5d+2}$

IV. Calcula el producto de las siguientes fracciones algebraicas

(1) $\frac{2xy^4}{3a^3b} \cdot \frac{5x^3y}{7ab^4}$	(2) $\frac{3(a-b)}{2x} \cdot \frac{-17(a-b)}{19x^2}$
(3) $\frac{x-2}{x-3} \cdot \frac{x-5}{x-6} \cdot \frac{z}{w}$	(4) $\frac{-x^3y^4}{x^4y^5} \cdot \frac{x^7y^8}{-x^{15}y^3}$
(5) $\frac{(x^2y^3)^4}{(a^3b^4)^5} \cdot \frac{(a^2b^3)^4}{(x^2y)^5}$	(6) $\frac{(-m^3n^4)^2}{(-cd^2)^3} \cdot \frac{(-c^2d)^5}{(-m^2n^3)^3}$
(7) $\frac{12x-3y}{15a+10b} \cdot \frac{21a+14b}{20x-5y}$	(8) $\frac{2x-2y}{x^2-y^2} \cdot \frac{7x+7y}{42x-42y} \cdot \frac{x-y}{x}$
(9) $\frac{a^2+3a-4}{ab^2} \cdot \frac{ab^5}{a^2+6a+8}$	(10) $\frac{a^2+9a+18}{a^2+8a+15} \cdot \frac{a^2+7a+10}{a^2+11a+18}$
(11) $\frac{z^2-10z+16}{z^2-9z+14} \cdot \frac{z^2-10z+21}{z^2+2z-15}$	(12) $\frac{m^2-6m-16}{m^2-10m-24} \cdot \frac{m^2+m-12}{m^2-m-6}$
(13) $\frac{x^2-9}{x^2-6x+9} \cdot \frac{x^2-7x+12}{x^2+8x+16} \cdot \frac{x^2+7x+12}{x^2+2x}$	(14) $\frac{x^2-y^2}{x^3-y^3} \cdot \frac{x^2-2xy+y^2}{x^2-2xy+y^2} \cdot \frac{x^2+xy+y^2}{5x+5y} \cdot \frac{3x-3y}{30x+30y}$
(15) $\frac{2a^2+7a+6}{2a^2+9a+9} \cdot \frac{2a^2+17a+8}{4a^2+9a+2}$	(16) $\frac{a^2-ab-12b^2}{2a^2-11ab+12b^2} \cdot \frac{2a^2-7ab+6b^2}{2a^2-9ab+10b^2}$

$$(17) \frac{x^3 - y^3}{x^2 - y^2} \cdot \frac{6x + 6y}{2x^2 + 2xy + 2y^2}$$

$$(18) \frac{5x^2 + 10xy + 5y^2}{x^3 + y^3} \cdot \frac{7x^2 - 7xy + 7y^2}{15x + 15y}$$

V. Calcula el cociente entre las siguientes fracciones algebraicas

$$(1) \frac{35a^3}{18b^3} : \frac{14ab^2}{9b^3}$$

$$(2) \frac{a^5b^8c^7}{a^4b^6c^{10}} : \frac{a^6b^8c^9}{a^3b^2c^5}$$

$$(3) \frac{24ab^3x^2y}{54a^3bxy^4} : \frac{9y^3}{x^3}$$

$$(4) \frac{a^2bx^2}{ab^3y^3} : \frac{3ax^2}{b^2y^3}$$

$$(5) \frac{6x^2 + 9xy}{a^3} : \frac{a}{14x^3 + 21x^2y}$$

$$(6) \frac{a^3 + a}{a^2 - a} : \frac{a^3 - a^2}{a^2 - 2a + 1}$$

$$(7) \frac{m^2 + 8m + 16}{m^2 + 2m - 8} : \frac{m^2 - 2m - 3}{m^2 - 3m + 2}$$

$$(8) \frac{c^2 - 6c + 5}{c^2 - 7c + 10} : \frac{c^2 + 8c + 7}{c^2 + 5c - 14}$$

$$(9) \frac{x^2 + 10x + 24}{x^2 + 3x - 18} : \frac{x^2 - 4x + 3}{x^2 - 6x + 9}$$

$$(10) \frac{m^2 + 14m + 48}{m^2 + 4m - 21} : \frac{m^2 + 4m - 32}{m^2 + 3m - 28}$$

$$(11) \frac{3p^2 + p - 2}{4p^2 + 7p + 3} : \frac{3p^2 - 8p + 4}{4p^2 - 5p - 6}$$

$$(12) \frac{6a^2 - 5a + 1}{4a^2 - 8a - 5} : \frac{12a^2 - a - 1}{8a^2 + 6a + 1}$$

$$(13) \frac{m^2 - 3m + 2}{m^2 - 5m + 4} : \frac{m^2 + 6m - 16}{m^2 + m - 20}$$

$$(14) \frac{x^3 - y^3}{x^2 - 2xy + y^2} : \frac{x^2 - y^2}{x^2 + 2xy + y^2}$$

$$(15) \frac{x^4 - y^4}{x^2 - 2xy + y^2} : \frac{x^2 - y^2}{x^2 + 2xy + y^2}$$

$$(16) \frac{x^3 - x}{x + 1} : \frac{x - 1}{x + 1}$$