

**Exercises of Algebraic fractions**


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1) Simplify the following algebraic fractions:

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

b)  $\frac{x^2 - 5x}{x^2 - 25}$

c)  $\frac{x^2 - 7x}{x^2 - 49}$

d)  $\frac{x^2 - 36}{x^2 + 6x}$

e)  $\frac{x^3 - 8x^2}{(x - 8)^2}$

f)  $\frac{(x + 5)^2}{x^2 - 25}$

g)  $\frac{x^2 - 3x}{x^2 - 9}$

h)  $\frac{x^2 - 25}{x^2 - 5x}$

i)  $\frac{x^3 - x^2}{(x - 1)^2}$

2) Calculate and simplify the following expressions:

a)  $\frac{x^3 - 4x^2}{(x - 4)^2} \cdot \frac{x^2 - 16}{x^2}$

b)  $\frac{x^3 - 8}{(x + 2)^2} \cdot \frac{(x - 2)^2}{x^2 - 4}$

c)  $\frac{x^2 - 81}{x^2 - 36} \cdot \frac{x^2 - 6x}{(x + 9)^2}$

d)  $\frac{x^3 + 4x^2}{(x + 4)^2} \cdot \frac{x^2}{x^2 - 16}$

e)  $\frac{x^3 + 2x^2}{(x + 2)^2} \cdot \frac{x^2 - 4}{x^2}$

f)  $\frac{(x + 1)^2}{x^3 + x^2} \cdot \frac{x^2 - 1}{x^2}$

g)  $\frac{x^3 - 6x^2}{(x - 6)^2} \cdot \frac{x^2 - 36}{x^2}$

h)  $\frac{(x - 2)^2}{x^3 + 8} \cdot \frac{x^2 - 4}{(x + 2)^2}$

i)  $\frac{(x - 6)^2}{x^2} \cdot \frac{x^2 + 6x}{x^2 - 36}$

3) Calculate and simplify the following expressions:

a)  $\frac{x}{x - 3} + \frac{2}{x^2 - 9}$

b)  $\frac{5x}{x - 8} - \frac{4}{x + 8}$

c)  $\frac{5}{x - 6} + \frac{2}{x + 6}$

d)  $\frac{x}{x - 4} + \frac{9}{x^2 - 16}$

e)  $\frac{2}{x^2 - 36} + \frac{3}{(x - 6)^2}$

f)  $\frac{7}{x - 5} + \frac{6}{x}$

g)  $\frac{7}{x + 5} + \frac{1}{x - 5}$

h)  $\frac{2}{x^2 - 25} + \frac{x}{x + 5}$

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

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**Answers:**

1)      a)  $\frac{x+2}{x-2}$                       b)  $\frac{x}{x+5}$                       c)  $\frac{x}{x+7}$                       d)  $\frac{x-6}{x}$

          e)  $\frac{x^2}{x-8}$                       f)  $\frac{x+5}{x-5}$                       g)  $\frac{x}{x+3}$                       h)  $\frac{x+5}{x}$

          i)  $\frac{x^2}{x-1}$

2)      a)  $x+4$                       b)  $\frac{x^2+2x+4}{x+2}$                       c)  $\frac{x(x-9)}{(x+9)(x+6)}$                       d)  $x-4$

          e)  $x-2$                       f)  $\frac{1}{x-1}$                       g)  $x+6$                       h)  $\frac{x-2}{x^2-2x+4}$

          i)  $\frac{x-6}{x}$

3)      a)  $\frac{x^2+3x+2}{x^2-9}$                       b)  $\frac{5x^2+36x+32}{x^2-64}$                       c)  $\frac{7x+18}{x^2-36}$                       d)  $\frac{x^2+4x+9}{x^2-16}$

          e)  $\frac{5x+6}{(x-6)^2(x+6)}$                       f)  $\frac{13x-30}{x(x-5)}$                       g)  $\frac{8x-30}{x^2-25}$                       h)  $\frac{x^2-5x+2}{x^2-25}$

          i)  $\frac{2x^2+x+15}{x^2-9}$