

第八章 分式

化简分式

例子

$$\frac{3x-3}{4x-4} = \frac{3(x-1)}{4(x-1)} = \frac{3}{4}$$

例子

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

加法、减法 (一定要同分母)

例子

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

例子

$$\left(\frac{x+2}{3x}\right) - \frac{x-3}{6x} = \frac{2(x+2)}{6x} - \frac{x-3}{6x}$$

乘法、除法

例子

$$\begin{aligned} & \frac{x^2+4x+4}{x-3} \times \frac{5}{3x+6} \\ &= \frac{(x+2)(x+2)}{x-3} \times \frac{5}{3(x+2)} \\ &= \frac{5(x+2)}{3(x-3)} \end{aligned}$$

例子

$$\begin{aligned} & \frac{4x-8}{6} \div \frac{x-2}{3} \\ &= \frac{4(x-2)}{6} \times \frac{3}{x-2} = 2 \end{aligned}$$

繁分式

$$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

分式方程式

例子

$$\begin{aligned} & \frac{6}{x+4} - \frac{3}{x-1} = 0 \\ & \frac{6}{x+4} = \frac{3}{x-1} \end{aligned}$$

$$6(x-1) = 3(x+4)$$

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

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

$$3x = 18$$

$$x = 6$$

1	$\frac{1}{x+3} - \frac{1}{2x-6} - \frac{3x-15}{2x^2-18} =$	2	$\frac{x^2-x-1}{x^2-x-2} - \frac{x^2-5x+7}{x^2-5x+6} =$
3	$\frac{1}{(x-y)(y-z)} + \frac{1}{(y-z)(x-z)} + \frac{1}{(z-x)(y-x)} =$	4	$\frac{2x}{2x-3} - \frac{2x}{2x+3} =$
5	$\frac{7x+6}{x^2-4} + \frac{5}{2-x} + \frac{2}{x+2} =$	6	$\frac{y-1}{y^2+3y+2} + \frac{2}{y+1} =$
7	$\frac{m^2+mn}{mn-n^2} + \frac{m^2+2mn+n^2}{n^2-m^2} =$	8	$\frac{1}{x+2} - \frac{1}{x^2+5x+6} =$
9	$\frac{1}{p^2-1} + \frac{1}{1-p} =$	10	$\frac{a}{a^2-16} - \frac{a-8}{16-a^2} =$
11	$\frac{2(h+1)}{2eh} - \frac{4+e}{4e} =$	12	$\frac{2}{x^2+4x+3} - \frac{3}{2+x-x^2} =$
13	$xy=1, \frac{x}{x+1} + \frac{y}{y+1} =$	14	$\frac{1}{x} + \frac{1}{y} = 8, x+y=2, xy=?$
15	$\frac{2}{2x+1} - \frac{7}{(x-3)(2x+1)} =$	16	$\frac{2}{a^2-2a} - \frac{3}{a^2-3a} + \frac{2}{a^2-5a+6} =$
17	$\frac{x+y}{xy} + \frac{y-z}{yz} - \frac{z+x}{zx} =$	18	$\frac{a-b}{a+b} + \frac{a+b}{a-b} =$
19	$\frac{2x}{x^2-y^2} + \frac{2y}{y^2-x^2} =$	20	$\frac{(-2x)^3 y^2 z}{(4xy)^3} =$
21	$\frac{m^2}{m-n} + \frac{n^2}{n-m} =$	22	$\frac{5}{2(y+1)} - \frac{1}{10(y-1)} - \frac{24}{5(2y+3)} =$
23	$\frac{b-c}{bc} + \frac{c-a}{ca} + \frac{a-b}{ab} =$	24	$\frac{1}{x+3} - \frac{1}{x-3} =$
25	$\frac{1}{2a-2b} - \frac{1}{3a-3b} =$	26	$\frac{16a^2bc}{48ab^2c^4} =$
27	$\frac{3a}{a+2b} + \frac{6b}{a+2b} =$	28	$\frac{6x}{2x-3y} + \frac{9y}{3y-2x} =$
29	$\frac{y^2-6y+5}{1-y} =$	30	$\frac{2x^2+x-6}{x^2-4} =$
31	$\frac{a^2+3a-ab-3b}{9-a^2} =$	32	$\frac{a^2-a-ab+b}{(a-b)(1-a)} =$
33	$\frac{mp+q+mq+p}{p+q} =$	34	$\frac{x^2+4x+3}{x^2-1} =$
35	$\frac{2x^2-18y^2}{2x^2+24xy-90y^2} =$	36	$\frac{6x^2+5x-6}{12x^2-11x+2} =$
37	$\frac{x(a-b)^2}{(a-b)^3} =$	38	$\frac{7ab^2(x+y)}{21b^3(x-y)} =$

39	$\frac{-8a^2b^4x}{(-2abx)^3} =$	40	$\frac{1}{2x+4} + \frac{1}{x-1} - \frac{x+5}{2x^2+2x-4} =$
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繁分式

1	$\frac{\frac{1}{a} + \frac{1}{b}}{a+b}$	2	$\frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}}}$
3	$\frac{\frac{1}{1-x} + \frac{1}{1+x}}{\frac{1}{1-x} - \frac{1}{1+x}}$	4	$\frac{1}{x + \frac{1}{1 + \frac{x+1}{3-x}}}$
5	$\frac{\frac{W+3}{4w}}{\frac{w-3}{2w}}$	6	$\frac{1 + \frac{1}{x+2}}{x - \frac{18}{x-3}}$
7	$\frac{\frac{3}{a+2} + 1}{1 + \frac{2}{a+2}}$	8	$\frac{1 - \frac{1}{y-1}}{y - \frac{8}{y+2}}$
9	$\frac{1 + \frac{x}{y}}{1 - \frac{x}{y}}$	10	$\frac{\frac{2}{x-1} + 1}{1 - \frac{3}{x-1}}$
11	$1 + \frac{1}{1 + \frac{1}{x}}$	12	$\frac{\frac{1}{xy} + \frac{2}{x}}{\frac{3}{y} - \frac{1}{xy}}$
13	$\frac{1 - \frac{2}{r} - \frac{8}{r^2}}{1 - \frac{1}{r} - \frac{6}{r^2}}$	14	$\frac{\frac{2}{x} - \frac{1}{xy}}{\frac{1}{xy} + \frac{2}{y}}$
15	$\frac{1 + \frac{3}{4} - \frac{4}{x^2}}{1 + \frac{2}{x} - \frac{3}{x^2}}$	16	$\frac{\frac{a}{b} + 2}{\frac{a^2}{b^2} - 4}$
17	$\frac{\frac{x^2}{y^2} - 1}{\frac{x}{y} + 1}$	18	$\frac{2 + \frac{x}{y}}{\frac{4}{y}}$

19	$\frac{3 - \frac{x}{y}}{\frac{6}{y}}$	20	$\frac{3 + \frac{1}{a}}{3 - \frac{1}{a}}$
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