12 $\dfrac{18}{81a^4-18a^2b^2+b^4}-\dfrac{3}{9a^4-a^2b^2}+\dfrac{9}{9a^2b^2-b^4}-\dfrac{2b^2}{a^2\left(b^2-9a^2\right)^2}$ $\left[\dfrac{1}{a^2b^2}\right]$

13 $\dfrac{a+4}{b}\cdot\dfrac{b^2}{a^2-16}$ $\left[\dfrac{b}{a-4}\right]$ $\qquad$ $\dfrac{10ab^2}{x^2-y^2}\cdot\dfrac{x-y}{5ab}$ $\left[\dfrac{2b}{x+y}\right]$

14 $\dfrac{xy}{(x-y)^2}\cdot\dfrac{x-y}{x+y}\cdot\left(1-\dfrac{y^2}{x^2}\right)$ $\left[\dfrac{y}{x}\right]$

15 $\dfrac{a^2+ab}{a^2+b^2}\cdot\left(\dfrac{a}{a-b}-\dfrac{b}{a+b}\right)$ $\left[\dfrac{a}{a-b}\right]$

16 $\dfrac{a^3-b^3}{a^3-b^3-3ab(a-b)}\cdot\dfrac{a^2-2ab+b^2}{a^2+ab+b^2}$ [1]

17 $\dfrac{x^8-y^8}{x^6+y^6}\cdot\dfrac{x+2y}{x^5+x^4y+xy^4+y^5}\cdot\dfrac{x^4-x^2y^2+y^4}{x^2+xy-2y^2}$ [1]

18 $\left(\dfrac{1}{a+1}-\dfrac{1}{a-2}+\dfrac{6-a}{a^2-a-2}\right)\cdot\left(\dfrac{1}{3+a}+\dfrac{2a-2}{9-a^2}\right)$ $\left[\dfrac{1}{(a-2)(a+3)}\right]$

19 $\left(a+\dfrac{1}{a}\right)^2\cdot\left(a-\dfrac{1}{a}\right)^2\cdot\dfrac{2a^2}{a^4-1}$ $\left[\dfrac{2\left(a^4-1\right)}{a^2}\right]$

20 $\dfrac{ab+ac-b-c}{3x^2-3}:\dfrac{2b+2c}{4x+4}$ $\left[\dfrac{2(a-1)}{3(x-1)}\right]$

21 $\dfrac{(x+y)|x-2y|}{x^2+xy-2y^2}:\dfrac{x^2-2xy}{x^2+2xy}$ $\left[\dfrac{x+y}{x-y}\right]$

22 $\dfrac{6+2x}{x^2-5x+6}:\left(\dfrac{x^2+6x+9}{x^2-2x}:\dfrac{9-x^2}{x^2}\right)$ $\left[-\dfrac{2}{x}\right]$

23 $\dfrac{xy+x+2y+2}{x^2-4}:\left(\dfrac{y^2m-m}{4x-8}:\dfrac{m}{xy-x+y-1}\right)$ $\left[\dfrac{4}{(y-1)^2(x+1)}\right]$

24 $\left(\dfrac{y-b}{y+b}+\dfrac{y+b}{y-b}\right):\left(\dfrac{b}{y}+\dfrac{y}{b}\right):\left[\dfrac{1}{by}:\left(\dfrac{1}{y^2}-\dfrac{1}{b^2}\right)\right]$ [−2]

ESERCIZI DA SVOLGERE

Semplifica le seguenti frazioni:

1 $\frac{12a^2xy}{6ab-4a^2c}; \frac{14a^2+7ax}{10ay-5xy}; \frac{ax^2-ay^2}{a^2x+a^2y}$ $\left[\frac{6ax}{3b-2ac}; \frac{7a}{5y}; \frac{x-y}{a}\right]$

2 $\frac{x^2-y^2}{2xy+x^2+y^2}; \frac{a^3-x^3}{a^2-x^2}; \frac{a^3+1}{4a^3-4a^2+4a}$ $\left[\frac{x-y}{x+y}; \frac{a^2+ax+x^2}{a+x}; \frac{a+1}{4a}\right]$

3 $\frac{(x+1)^2-(x-1)^2}{(x^2+2)^2-2x^2-4}; \frac{a^2x-a^2z-c^2x+c^2z}{a^4x-c^4x}$ $\left[\frac{4}{x(x^2+2)}; \frac{x-z}{x(a^2+c^2)}\right]$

Riduci i seguenti gruppi di frazioni allo stesso denominatore:

4 $\frac{2x}{9-x^2}; \frac{1-x}{3+x}; \frac{2x+3}{3-x}$ $\left[\frac{2x}{(3+x)(3-x)}; \frac{(3-x)(1-x)}{(3+x)(3-x)}; \frac{(3+x)(2x+3)}{(3+x)(3-x)}\right]$

5 $\frac{x-1}{x^2+4xy+4y^2}; \frac{x-y}{x^3+2x^2y}; \frac{2x}{x^2-4y^2}$ $\left[\frac{x^2(x-2y)(x-1)}{x^2(x+2y)^2(x-2y)}; \frac{(x^2-4y^2)(x-1)}{x^2(x+2y)^2(x-2y)}; \frac{2x^3(x+2y)}{x^2(x+2y)^2(x-2y)}\right]$

6 $\frac{a-2+b}{a^2+4-4a-b^2}; \frac{a+b}{a^2+b^2+2ab-2a-2a}$ $\left[\frac{(a+b-2)}{(a+b-2)(a-b-2)}; \frac{a-b-2}{(a+b-2)(a-b-2)}\right]$

7 $\frac{1}{x^2+xy-2y^2}; \frac{x-y}{x^2+3xy+2y^2}; \frac{x-2y}{x^2-y^2}$ $\left[\frac{x+y}{(x^2-y^2)(x+2y)}; \frac{(x-y)^2}{(x^2-y^2)(x+2y)}; \frac{x^2-4y^2}{(x^2-y^2)(x+2y)}\right]$

Esegui le seguenti operazioni:

8 $\frac{-5}{3x+1}+\frac{3x}{9x^2-1}-\frac{4}{1-3x}$ $\left[\frac{9}{3x-1}\right]$

9 $\frac{a}{a^2+ab}+\frac{a+b}{ab-b^2}-\frac{b}{a^2-b^2}-\frac{a^2+2ab}{a^2b-b^3}$ $\left[\frac{1}{a+b}\right]$

10 $\frac{m+2}{m^2-9m+14}-\frac{5-m}{m^2-7m+10}+\frac{5-m}{m^2-12m+35}$ $\left[\frac{m-3}{(m-2)(m-7)}\right]$

11 $\frac{3}{x^2-1}+\frac{4x}{2x^2+x-3}-\frac{3x+2}{2x^2+5x+3}+\frac{x^2-10x-14}{2x^3+3x^2-2x-3}$ $\left[\frac{1}{x+1}\right]$