LEZIONE 17

Espressioni polinomiali

$$\frac{1}{6}\cdot\frac{9}{4}=\frac{9}{24}$$

$$\frac{1}{2}(xy)^2\cdot\left(\frac{3}{4}x^3+\frac{1}{3}x+\frac{1}{2}\right)-\left(\frac{1}{2}xy+3\right)\cdot\left(\frac{1}{2}xy-3\right)+\frac{1}{6}x^2\left(\frac{1}{2}x^1y^2-\frac{9}{4}x^3y^2\right)=$$

$$=\frac{1}{2}x^2y^2\cdot\left(\frac{3}{4}x^3+\frac{1}{3}x^1+\frac{1}{2}\right)-\left(\frac{1}{4}x^2y^2-\cancel{\frac{3}{2}xy}+\cancel{\frac{3}{2}xy}-9\right)+\frac{1}{12}x^3y^2-\frac{\cancel{9}^{3}}{\cancel{24}_{8}}x^5y^2=$$

$$=\cancel{\frac{3}{8}x^5y^2}+\frac{1}{6}x^3y^2+\cancel{\frac{1}{4}x^2y^2}-\cancel{\frac{1}{4}x^2y^2}+9+\frac{1}{12}x^3y^2-\cancel{\frac{3}{8}x^5y^2}=$$

$$=\left(\frac{1}{6}+\frac{1}{12}\right)x^3y^2+9=\left(\frac{2+1}{12}\right)x^3y^2+9=$$

$$=\frac{\cancel{3}^{1}}{\cancel{12}_{4}}x^3y^2+9=\boxed{\frac{1}{4}x^3y^2+9}$$

$$\left(\frac{1}{6}x^2 + xy\right)\cdot\left(-\frac{1}{9}x + \frac{2}{3}y\right) + \left(\frac{1}{7}xy - \frac{8}{3}y^2\right)\cdot(x-3y) + \frac{1}{2}\cdot\left(\frac{1}{3}x\right)^3 - (2y)^3 =$$

$$= \left(-\frac{1}{54}x^3 + \frac{\cancel{2}^{1}}{\cancel{18}_{9}}x^2y - \frac{1}{9}x^2y + \frac{2}{3}xy^2\right) + \left(\frac{1}{7}x^2y - \frac{3}{7}xy^2 - \frac{8}{3}xy^2 + \frac{\cancel{24}^{8}}{\cancel{3}_{1}}y^3\right) + \frac{1}{2}\left(\frac{1}{27}x^3\right) - 8y^3 =$$

$$= \left(-\frac{1}{54}x^3 + \cancel{\frac{1}{9}x^2y} - \cancel{\frac{1}{9}x^2y} + \frac{2}{3}xy^2\right) + \frac{1}{7}x^2y - \frac{3}{7}xy^2 - \frac{8}{3}xy^2 + 8y^3 + \frac{1}{54}x^3 - 8y^3 =$$

$$= \cancel{-\frac{1}{54}x^3} + \frac{2}{3}xy^2 + \frac{1}{7}x^2y - \frac{3}{7}xy^2 - \frac{8}{3}xy^2 + \cancel{8y^3} + \cancel{\frac{1}{54}x^3} - \cancel{8y^3} =$$

$$= \left(\frac{2}{3} - \frac{3}{7} - \frac{8}{3}\right)xy^2 + \frac{1}{7}x^2y = \left(\frac{14 - 9 - 56}{21}\right)xy^2 + \frac{1}{7}x^2y =$$

$$= -\frac{\cancel{51}}{\cancel{21}}xy^2 + \frac{1}{7}x^2y = \boxed{-\frac{17}{7}xy^2 + \frac{1}{7}x^2y}$$

$$\frac{9}{2}x^6\cdot\left(\frac{1}{3}x^2y^4\right)^3-\left[\frac{4}{3}x^4y^6\cdot\left(\frac{1}{4}x^4y^3\right)^2+\frac{1}{6}y^6\cdot\left(\frac{1}{2}x^4y^2\right)^3\right]+\left(x^3y\right)^2=$$

$$=\frac{9}{2}x^6\cdot\left(\frac{1}{27}x^6y^{12}\right)-\left[\frac{4}{3}x^4y^6\cdot\left(\frac{1}{16}x^8y^6\right)+\frac{1}{6}y^6\cdot\left(\frac{1}{8}x^{12}y^6\right)\right]+x^6y^2=$$

$$=\frac{\cancel{9}^{\,1}}{\cancel{54}_{\,6}}x^{12}y^{12}-\left[\frac{4}{48}x^{12}y^{12}+\frac{1}{48}x^{12}y^{12}\right]+x^6y^2=$$

$$=\frac{1}{6}x^{12}y^{12}-\frac{\cancel{4}^{\,1}}{\cancel{48}_{\,12}}x^{12}y^{12}-\frac{1}{48}x^{12}y^{12}+x^6y^2=$$

$$=\left(\frac{1}{6}-\frac{1}{12}-\frac{1}{48}\right)x^{12}y^{12}+x^6y^2=$$

$$=\left(\frac{8-4-1}{48}\right)x^{12}y^{12}+x^6y^2=\frac{\cancel{3}^{\,1}}{\cancel{48}_{\,16}}x^{12}y^{12}+x^6y^2=$$

$$=\boxed{\frac{1}{16}x^{12}y^{12}+x^6y^2}$$

$$(x+y)\boxed{(x+y+1)(x+y-1)}-(x+y)\left[x^2(x+2)-x^3-x^2\right]-(x+y)\left[y^2(y+2)-y^2-y^3\right]-(x+y)(2xy+1)=$$

$$=(x^2+xy+x+xy+y^2+y)(x+y-1)-(x+y)\left[\cancel{x^3}+2x^2-\cancel{x^3}-x^2\right]-(x+y)\left[\cancel{y^3}+2y^2-y^2-\cancel{y^3}\right]-(2x^2y+x+2xy^2+y)=$$

$$=(x^3+x^2y-x^2+x^2y+xy^2-\cancel{xy}+\cancel{x^2}+\cancel{xy}-x+x^2y+xy^2-\cancel{xy}+xy+y^3-\cancel{y^2}+\cancel{xy}+\cancel{y^2}-y)+$$

$$-(x+y)\left[x^2\right]-(x+y)\left[y^2\right]-2x^2y^2-x-2xy^2-y=$$

$$=(\cancel{x^3}+\cancel{x^2y}+\cancel{x^2y}+\cancel{xy^2}-x+\cancel{x^2y}+\cancel{xy^2}+\cancel{xy^2}+\cancel{y^3}-y)$$

$$-\cancel{x^3}-\cancel{x^2y}-\cancel{xy^2}-\cancel{y^3}-2\cancel{x^2y}-x-2\cancel{xy^2}-y=$$

$$=-2x-2y$$

$$\left[\left(\frac{1}{3}\right)^2 \cdot \left(-\frac{2}{3}+\frac{1}{1}\right)^{-2} \cdot \left(\frac{1}{1}-\frac{8}{9}\right)^2 : \left(\frac{1}{27}\right)\right] : \left[\left(\frac{1}{3}\right)^6 : 27^{-2}\right] =$$

$$= \left[\frac{1}{9} \cdot \left(\frac{-2+3}{3}\right)^{-2} \cdot \left(\frac{9-8}{9}\right)^2 : \frac{1}{27}\right] : \left[\left(\frac{1}{3}\right)^6 : \left(3^3\right)^{-2}\right] =$$

$$= \left[\frac{1}{9} \cdot \left(\frac{1}{3}\right)^{-2} \cdot \left(\frac{1}{9}\right)^2 : \frac{1}{27}\right] : \underbrace{\left[3^{-6} : 3^{-6}\right]}_{=1} =$$

$$= \left[\frac{1}{9} \cdot \cancel{9}^{1} \cdot \left(\frac{1}{81}\right) : \frac{1}{27}\right] : 1 =$$

$$= \left[\left(\frac{1}{9} \cdot \frac{1}{9}\right)_1 : \frac{1}{27}\right] : 1 = \left[\frac{1}{81} : \frac{1}{27}\right] : 1 = \frac{1}{\cancel{81}_3} \cdot \frac{\cancel{27}^1}{1}$$

$$= \frac{1}{3}$$

$$\left(\frac{1}{3}\right)^{-2} = 3^2 = 9$$