

Problema: AL0014 - Algebra letterale

Testo [AL0014] [1 ★ 2 🕒 1 📖] Svolgi le seguenti espressioni con i monomi.

$$(a) \quad \xi = \left(-\frac{5}{2}ab^3\right)^2 + \left(-\frac{1}{2}ab\right)\left(-\frac{3}{2}ab^2\right)(-2b)^3$$

$$(b) \quad \xi = \left(-\frac{2}{5}a^2b^4\right)^2 - (-2ab)^2 \cdot \left(-\frac{1}{5}ab^3\right)^2$$

$$(c) \quad \xi = 2x\left(-\frac{1}{2}ax^2\right)^3 - ax(-ax^3)^2 + (x^2 + 2x^2)^4 - (-3x^2)^4$$

$$(d) \quad \xi = \left[\frac{2}{9}x^2(-xy^2)^2\right]^2 - \left[\left(-\frac{1}{3}x\right)^3(-3xy^4)\right]^2$$

$$(e) \quad \xi = \left[-\left(-\frac{3}{2}x^3\right)^3\right]^4 : \left[\left(-\frac{3}{2}x^2\right)^2 - 2x^4\right]^6$$

$$(f) \quad \xi = \left(-\frac{3}{4}x^3y^2\right)^2 : \left[\left(-\frac{3}{2}xy\right)^2 + x^2y^2\right]$$

$$(g) \quad \left[a\left(\frac{5}{3}a^3b\right)^5 : \left(\frac{5}{6}a^2\right)^5 - a^2b(-2a^2b^2)^2\right] : (-2a^2) + (4a^2b^3)^2 : \left(\frac{8}{5}b\right)$$

$$(h) \quad -(-ax)^2 + \left[-ax^3 \cdot (-5a^3x) : (-ax)^2\right]^2 : \left(-\frac{5}{2}ax\right)^2$$

$$(i) \quad \left[(-5x^3y^2)(-xy^2) : (-xy)^2\right]^2 : (-5x^2y)^2 - (-y)^2 + (2y)^2$$

Spiegazione Nelle espressioni con i monomi segui le stesse regole che segui nelle espressioni numeriche, in quanto le lettere rappresentano di fatto dei numeri.

Svolgimento Qui di seguito le soluzioni degli esercizi proposti

(a)

$$\xi = \frac{25}{4}a^2b^6 + \frac{3}{4}a^2b^3(-8b^3) = \frac{25}{4}a^2b^6 - 6a^2b^6 = \frac{1}{4}a^2b^6$$

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(b)

$$\xi = \frac{4}{25}a^4b^8 - 4a^2b^2 \cdot \frac{1}{25}a^2b^6 = \frac{4}{25}a^4b^8 - \frac{4}{25}a^4b^8 = 0$$

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(c)

$$\begin{aligned}\xi &= 2x \left(-\frac{1}{8}a^3x^6 \right) - ax(a^2x^6) + (3x^2)^4 - 81x^8 = \\ &= -\frac{1}{4}a^3x^7 - a^3x^7 + 81x^8 - 81x^8 = -\frac{5}{4}a^3x^7\end{aligned}$$

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(d)

$$\xi = \left[\frac{2}{9}x^2 \cdot x^2y^4 \right]^2 - \left[-\frac{1}{27}x^3 \cdot (-3xy^4) \right]^2 = \left[\frac{2}{9}x^4y^4 \right]^2 - \left[\frac{1}{9}x^4y^4 \right]^2 = \frac{4}{81}x^8y^8 - \frac{1}{81}x^8y^8 = \frac{3}{81}x^8y^8$$

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(e) $\xi = \left(-\frac{1}{2}x^3 \right)^{12} : \left[\frac{9}{4}x^4 - 2x^4 \right]^6 = \frac{1}{2^{12}}x^{36} : \left[\frac{1}{4}x^4 \right]^6 = \frac{1}{2^{12}}x^{36} : \frac{1}{2^{12}}x^{24} = x^{12}.$

(f) $\xi = \frac{9}{16}x^6y^4 : \left[\frac{9}{4}x^2y^2 + x^2y^2 \right] = \frac{9}{16}x^6y^4 : \frac{13}{4}x^2y^2 = \frac{9}{52}x^4y^2.$

(g)

$$\left[a \left(\frac{5}{3}a^3b : \left(\frac{5}{6}a^2 \right) \right)^5 - a^2b \cdot 4a^4b^4 \right] : (-2a^2) + \frac{16a^4b^6}{\frac{8}{5}b}$$

$$\left[a(2ab)^5 - 4a^6b^5 \right] : (-2a^2) + 10a^4b^5$$

$$\left[32a^6b^5 - 4a^6b^5 \right] : (-2a^2) + 10a^4b^5$$

$$\frac{28a^6b^5}{-2a^2} + 10a^4b^5$$

$$-14a^4b^5 + 10a^4b^5$$

$$-4a^4b^5$$

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(h)

$$-a^2x^2 + \left[\frac{5a^4x^4}{a^2x^2} \right]^2 : \left(\frac{25}{4}a^2x^2 \right)$$

$$-a^2x^2 + [5a^2x^2]^2 : \left(\frac{25}{4}a^2x^2 \right)$$

$$-a^2x^2 + (25a^4x^4) : \left(\frac{25}{4}a^2x^2 \right)$$

$$-a^2x^2 + 4a^2x^2$$

$$3a^2x^2$$

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(i)

$$\begin{aligned} & \left[5x^4y^4 : x^2y^2\right]^2 : (25x^4y^2) - y^2 + 4y^2 \\ & \left[5x^2y^2\right]^2 : (25x^4y^2) + 3y^2 \\ & \left[25x^4y^4\right] : (25x^4y^2) + 3y^2 \\ & y^2 + 3y^2 \\ & 4y^2 \end{aligned}$$

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