Serie nr. 3 **18 settembre 2019**

Calcolo letterale – operazioni con i monomi.

1) Completa inserendo il monomio mancante in modo che l'uguaglianza sia vera.

75 $2a \cdot \square = -8a^2b^2$

76 $\square \cdot 3s^2t^4 = 12s^3t^5$

77 $4a^6b^8 \cdot \square = \frac{1}{2}a^8b^{12}$

78 $4a^3 - 2a\square = -5a^3$

79 $(3a^5b^2)\square = 9a^{10}b^4$

80 $2ab \cdot \left(-\frac{1}{2}a^2b\right) \cdot \square = a^4b^3$

81 $3xy^2 \cdot \left(-\frac{1}{5}xy^2\right) \cdot \square = -3x^5y^5$

82 $\square \cdot (-6a^2b)\left(-\frac{1}{4}ab\right) = 9a^4b^5$

83 $-2xy \cdot \left(\frac{2}{3}xy\right) \cdot \square = -\frac{1}{2}x^7y^5$

84 $\left(-\frac{1}{3}x^2y^2\right)(6x) \cdot \square = 8x^6y^8$

2) Semplifica le seguenti espressioni letterali.

86 $a^2x \cdot \left(\frac{1}{2}x\right) + \left(\frac{1}{2}ax\right) \cdot \left(\frac{2}{3}a\right) - \frac{2}{3}a^2x^2$ $\left[-\frac{1}{6}a^2x^2 + \frac{1}{3}a^2x\right]$

87 $(-2x)\left(-\frac{1}{2}y\right) + (-2y)x + xy + y(-x) + 2xy + y(-x)$ $[0]$

88 $x^2 + 7x^2 - 2(-x^2) + 2(-4)x^2 + 2x^2 - 2x^2 + x^2 - x(2x) + 4x^2 - 2(2x^2)$ $[x^2]$

89 $2x^2y^2(3x^2y^2) - (-xy)(5x^3y^3) - (-4x^2y^2)2x^2y^2 - 7x^4y^4$ $[12x^4y^4]$

90 $-\frac{7}{2}x(-x^2) + (-x)\left(-\frac{1}{2}x^2\right) + \frac{4}{5}x^2(-5x) + x^3$ $[x^3]$

91 $\left(x^2 + \frac{2}{5}x^2\right) \cdot a + \left(a - \frac{13}{5}a\right)\left(\frac{7}{8}x^2 - x^2\right)$ $\left[\frac{8}{5}ax^2\right]$

92 $3{,}5x\left(\frac{1}{7}bx^2\right) + 3b(-x^3) - x^2b\left(-\frac{1}{2}x\right) + \left(-\frac{1}{2}x^2\right)(-xb)$ $\left[-\frac{3}{2}bx^3\right]$

93 $(+y^4) - 3y(-y^3) + 6xy(-x^3y^3) - 4xy^3\left(-\frac{3}{2}x^3y\right)$ $[4y^4]$

3) Calcola le seguenti potenze di monomi.

104 $(-ax)^2$; $\left(-\frac{1}{2}xy\right)^3$; $(2a^2b)^3$; $(a^2b)^0$.

105 $(-ab^2)^3$; $-(ab^2)^3$; $(-3a^2b^5c^3)^3$; $\left(-\frac{2}{3}a^6b^2c^3\right)^4$.

106 $\left(-\frac{1}{2}a^3b^2c\right)^5$; $\left(\frac{3}{4}x^2y^3\right)^0$; $\left(-\frac{3}{2}a^2bc^4\right)^2$; $(3a^2b^5c^3)^3$.

107 $(3a^2b^5c^3)^2$; $(-5ab^5)^3$; $(-2a^2b^2c^2)^4$.

4) Semplifica le seguenti espressioni con le potenze.

140 $2a\left(-\frac{1}{2}a^2b\right)^3 - ab(-a^3b)^2 + (a^2+2a^2)^4 - (-9a^4)^2$ $\left[-\frac{5}{4}a^7b^3\right]$

141 $[3a(-ab^2)^2]^2 - \left[\left(-\frac{1}{2}a\right)^3(-2ab^3)\right]^2$ $\left[9a^6b^8 - \frac{1}{16}a^8b^6\right]$

142 $-\left[2(3a^2b-4a^2b)^3 \cdot \left(-\frac{1}{3}a^2+\frac{1}{2}a^2\right)^2\right]^0 (2a^2)^3$ [se $a \neq 0$ e $b \neq 0$, $-8a^6$]

143 $\left[\left(-\frac{3}{4}a^3\right)^2 \cdot \left(\frac{16}{3}b^4\right)^3 - 3(a^2)^3(b^3)^4\right]^0 - 2$ [se $a \neq 0$ e $b \neq 0$, -1]

144 $\left(\frac{4}{5}a^3\right)^2 \cdot \left(\frac{5}{16}b^2\right) + \frac{4}{5} \cdot (a^3b)^2 - 2(a^2)^3 \cdot (-b)^2 + a^6b^2$ [0]

145 $(-2x^3y)^4 + [-(-x^3y)^2]^2 - y\left(\frac{1}{2}x^3y\right)^3(-2x)^3 - (4x^6y^2)^2 + (-2x)^4\left(\frac{1}{2}y\right)^2$ $[2x^{12}y^4 + 4x^4y^2]$

5) Esegui le seguenti divisioni tra monomi.

147 $4a^2bc^5 : 2abc$; $-3a^4b^7c : (-3a^4b^5)$.

148 $a : \frac{1}{4}$; $ab^2 : \frac{1}{7}a^2b$.

149 $\frac{5}{2}ax^4 : (-ax^4)$; $x^{10}y^9 : \frac{3}{7}x^{10}y^9$.

150 $\frac{1}{5}ab^6c^2 : \left(-\frac{3}{10}b^4c\right)$; $-5x^2y^3 : (5xy^2)$.

151 $-\frac{3}{4}a^2b^5 : \left(-\frac{1}{4}a^2b^3\right)$; $\frac{1}{2}ab^3 : (-2a^2b^3)$.

152 $-\frac{2}{3}(ab^2)^3 : (ab^2)^2$; $(a^2b^4)^3 : (-2a^2b^3)^2$.

153 $(-15x^3yc^2) : (-2xy^2z^3)$; $\left(-\frac{2}{5}a^3b^2c\right) : \left(-\frac{2}{5}a^2bc\right)^3$.

154 $\frac{2}{7}x^3y : \left(-\frac{1}{2}x^3y\right)$; $\left(-\frac{2}{8}a^3b^4\right)^2 : \left(\frac{1}{3}a^2b^3\right)$.

155 $\left(-\frac{2}{5}a^2b^3c^5\right) : \left(\frac{4}{15}ab^2c^3\right)$;

$\left(\frac{1}{5}ab^2c^3\right)^2 : \left(-\frac{2}{5}ab^2c^5\right)$.

156 $\left(-\frac{3}{4}x^3y^2\right)^2 : \left(-\frac{3}{2}xy\right)^2$;

$\left[-\left(-\frac{3}{2}a^3\right)^3\right]^4 : \left[\left(-\frac{3}{2}a^2\right)^2\right]^6$.

6) Semplifica le seguenti espressioni algebriche.

199 $(2mnp)^2 \cdot \left(\frac{1}{2}m\right) + m^3n^2p^2 + (-3m^3np^2)(2n) - (5m^5n^4p^3) : (-2m^2n^2p) + \left(\frac{1}{2}m^2p^2\right)(-3mn^2)$ $[-2m^3n^2p^2]$

200 $\left[\frac{1}{2}x(-4x)^2 + 4x^3\right] : (+2x)^2 + \left\{\left[-\frac{1}{3}y(-3x)^2\right]^2\right\}^2 : \left[\left(-\frac{9}{2}x^5y^3\right)(-6x^2y)\right]$ $[6x]$

201 $-3ab\left(-\frac{2}{3}ab^2\right)^2 : \left(+\frac{2}{3}a^3b^3\right) - \left[+\frac{4}{3}ab^2 : \left(-\frac{2}{3}a\right)\right] + (-3a^2b)^3 : \left(\frac{3}{2}a^2b + \frac{3}{4}a^2b\right)$ $[-12a^4b^2]$

202 $\left[-(-2ax^2)^2 : \left(-\frac{5}{2}ax^2\right) - \frac{3}{5}(-a^2x)^3 : (-a^5x)\right]^2 : \left(-\frac{1}{2}x\right)^3 + 50x\left(-\frac{1}{5}a\right)^2$ $[-6a^2x]$

203 $\left\{\left[\left(3-\frac{7}{2}\right)x^3y^2z\right]^2 : \left(+\frac{1}{2}x^2y\right)^3 + 3y(-z)^2\right\} : (+2z^2)\left[\left(\frac{7}{6}x^3y - \frac{1}{6}x^3y\right) : (-x)^3\right]$ $\left[-\frac{5}{2}y^2\right]$

204 $\left\{\left(-\frac{3}{2}xy^2\right)\left(+\frac{4}{9}x^2y^2\right) - \left[\left(-\frac{1}{5}x^4y^6\right) : \left(-\frac{3}{5}xy^2\right) + \frac{4}{3}y(xy-2xy)^3\right]\right\} : \left[-\frac{1}{9}(-xy)^3\right]$ $[3y]$

205 $\left\{\left(-\frac{9}{2}x^3\right)\left[\left(-\frac{2}{3}xy^2\right)^3 - \left(-\frac{1}{3}xy^4\right)\left(-\frac{2}{3}xy\right)^2\right] + \frac{1}{3}x^6y^6\right\} : \left[(-xy^2)\left(\frac{5}{3}x^3y^2 - \frac{2}{3}x^3y^2\right)\right]$ $[-x^2y^2]$