

ESERCITAZIONE DI MATEMATICA PER LE VACANZE CLASSE PRIMA

Risolvi gli esercizi proposti su foglio protocollo da consegnare al rientro a scuola all' insegnante.

Determina il M.C.D. e il m.c.m. dei seguenti numeri naturali.

(3; 35; 21) (40; 24; 8) (18; 24; 112) (9; 15; 63)

Calcola il valore delle seguenti espressioni.

$$1. \left\{ \left[(+3)^2 \right]^3 \cdot \left[(-27)^3 \cdot 3^7 \right] : \left[(-3)^2 \right]^{10} + \left[4^2 \right]^3 \cdot \left[(+4)^{16} : (-4)^3 : (-4)^5 \right]^3 : \left[(-4)^7 \right]^4 \right\} - 5^2 = \quad \text{(-18)}$$

$$2. \left\{ (-3)^7 \cdot (2^2 + 5^0)^7 \right\} : (45^2 : 3^2)^2 : (81^2 : 9^3 + 6)^7 : (-5)^3 = \quad \text{(-27)}$$

$$3. \left\{ \left[\left(\frac{4}{3} - \frac{1}{4} \right) \cdot \left(-\frac{2}{13} + 3 \right) - \frac{30}{12} \right] : \frac{7}{4} - \frac{2}{3} \right\} \cdot \frac{3}{5} - \frac{2}{5} + \frac{9^3}{36} : \frac{3^4}{4} = \quad \text{(2/5)}$$

$$4. \left[\left(1 + \frac{1}{2} \right)^3 \cdot \left(2 - \frac{1}{2} \right)^5 \right]^2 \cdot \left(\frac{3}{2} \right)^2 : \left[\left(-\frac{3}{2} \right)^8 \cdot \left(\frac{3}{2} \right)^7 \right] = \quad \text{(27/8)}$$

$$5. \left\{ \left[\left(\frac{4}{9} - \frac{1}{3} \right)^2 - \left(\frac{3}{5} - \frac{1}{3} \right)^2 \cdot \left(\frac{5}{3} \right)^2 + \frac{1}{2} \right] : \left(-\frac{17}{27} \right) + \frac{3}{4} \right\}^2 - \left(\frac{1}{32} \right)^3 : \left(\frac{1}{128} \right)^2 + \frac{1}{2} = \quad \text{(1/16)}$$

Risolvi le seguenti espressioni con i monomi.

$$1. x^2 + (-x) - 3ab + (-4x^2) + 5ab + x =$$

$$2. a^2b^2 + \frac{3}{5}a^2b \left(-\frac{2}{3}b + b - \frac{7}{6}b \right) = \quad \left[\frac{1}{2}a^2b^2 \right]$$

$$3. \left[(+x^3y^3)^3 + \left(-\frac{2}{7}x^2y^2 \right)^3 \cdot \left(-\frac{7}{2}xy \right)^3 \right] : (-2x^2y^2)^3 + \frac{3}{2}x^3y^3 = \quad \frac{5}{4}x^3y^3$$

$$4. \left[(2xy - 3xy)^3 - (5xy - 3xy)^4 : (-4xy) + (-2x^5y^5) : \left(\frac{1}{2}xy + \frac{1}{2}xy \right)^2 \right] : \left(-\frac{1}{2}x \right)^3 = \quad [-8y^3]$$

$$5. \left[\left(\frac{7}{9}x^2y^3 \right)^4 \cdot \left(\frac{6}{7}x^3y \right)^4 : \left(\frac{4}{3}x^3y^3 \right)^4 - \left(-\frac{1}{2}x^3y^2 \right)^2 \cdot (-x^2) \right] : \left(-\frac{5}{4}x^2y \right)^3 = \quad \left[-\frac{4}{25}x^2y \right]$$

Risolvi le seguenti espressioni con i polinomi.

$$1. (a - 2b^2) - (4b^2 + 2a) + 2b(4 + 3b) = \quad [-2a + 8b]$$

$$2. 9(x^2y)^2 + \frac{1}{4}x(xy + 3y) - \frac{1}{3}xy(3x + 1) - x^2(3xy)^2 = \quad \left[-\frac{3}{4}x^2y + \frac{5}{12}xy \right]$$

$$3. \frac{1}{3}x \left(\frac{1}{2} + y - 9x \right) + \frac{1}{2}y \left(-\frac{2}{3}x + \frac{1}{7}x^3y^2 \right) + (2xy)^2 + (xy)^2(xy - 4) + x^2(y + 3) =$$

$$\left[\frac{1}{6}x + x^2y + \frac{15}{14}x^3y^3 \right]$$

$$4. (x^2 - y^2)(x^4 + y^4 + x^2y^2)(x + 1) - x^2(x^5 + x^4 + 1) + y^2(y^4 + xy^4 + 1) = \quad [-x^2 + y^2]$$

Risolvi i seguenti prodotti notevoli.

$$\begin{array}{lll}
1. (a+2b)^2 = & 2. \left(2a^2 - \frac{1}{3}b^3\right)^2 = & 3. \left(\frac{2}{3}x^3 - 2x^2\right) = \\
4. (3x+2)^3 = & 5. \left(\frac{1}{3}x^2 - 3\right)^3 = & 6. \left(2a^2 - \frac{1}{3}b^3\right)^3 = \\
7. (a-2b^2+3)^2 = & 8. \left(\frac{1}{2}a - b + \frac{1}{3}\right)^2 = & 9. \left(a^2 - \frac{1}{2}ab - b^2\right) = \\
10. \left(\frac{1}{2}a+3b\right)\left(\frac{1}{2}a-3b\right) = & 11. (-2a^2+3b)(-2a^2-3b) = &
\end{array}$$

Risolvi le seguenti espressioni con i prodotti notevoli.

$$\begin{array}{ll}
1. (2x+1)^2 + (x+1)(x-1) - (x+2)(x-2) = & [4x^2 + 4x + 4] \\
2. (a^2 - a - 1)^2 + (a-1)^3 - a^3(a-1) = & [5a - 4a^2] \\
3. \left[\left(\frac{5}{6}x^2 + 3x\right)^3 - \left(\frac{5}{6}x^2 - 3x\right)^3\right] : (2x^3) - \left[\left(\frac{5}{2}x - 8\right)^2 + 4(10x+1)\right] = & [-41] \\
4. \left[\left(-x^2y - \frac{1}{25}\right)^2 - (9x + 27xy^2)(-3y) - \left(\frac{1}{25} + x^2y\right)^2 - 27xy(3y^2 + 1)\right] : (xy^2 - 7)^2 = & [0] \\
5. \left(\frac{2}{5}x^2 - y^3\right)\left(y^3 + \frac{2}{5}x^2\right) - \left[\left(\frac{1}{2}x + \frac{2}{3}y\right)^3 - \frac{1}{6}xy(3x+4y) - \frac{8}{27}y^3\right] \cdot 8x = & \left[-\frac{21}{25}x^4 - y^6\right]
\end{array}$$

Risolvi le seguenti equazioni e disequazioni di primo grado.

$$\begin{array}{ll}
1. 3(x-2) + 9 = 7(x-3) & x=6 \\
2. \frac{(x-3)}{2} - \frac{(2+x)}{4} = \frac{(2-x)}{4} & x=5 \\
3. (x+1)(x-1) = (x+1)^2 & x=-1 \\
4. [x(x-1) - (x-2)^2] = 2(x-1) & x=2 \\
5. \frac{1}{4}[x(x-1) - (x-2)^2] = \frac{1}{3}(x+2) & x=4 \\
6. 3 + (x+2)(x-3) \geq (x+1)^2 & \left[x \leq -\frac{4}{3}\right] \\
7. \frac{2x-1}{2} \geq \frac{1}{5}x & \left[x \geq \frac{5}{8}\right] \\
8. \frac{x+4}{2} + \frac{1-2x}{3} \geq \frac{x+3}{2} & \left[x \leq \frac{4}{5}\right] \\
9. (x+1)^2 - x < x(x+1) + 2x - 1 & [x > 1] \\
10. 2x\left(x + \frac{1}{8}\right) - 1 > (x+1)(2x+3) - 3x & \left[x < -\frac{16}{7}\right]
\end{array}$$

Scomponi i seguenti polinomi.

$$1. \frac{4}{9}a^2 - b^2 =$$

2. $x^2 + 10x + 25 =$

3. $9a^2 - 12ab + 4b^2 =$

4. $x^3 + \frac{3}{2}x^2 + \frac{3}{4}x + \frac{1}{8} =$

5. $4a^2 - 2ab + \frac{1}{4}b^2 =$

6. $a^2 - 36 =$

7. $\frac{1}{25}a^2 - \frac{4}{49}b^2 =$

8. $\frac{1}{8}a^3 - \frac{8}{27}b^3 - \frac{1}{2}a^2b + \frac{2}{3}ab^2 =$

9. $27a^3 + 8b^3 + 54a^2b + 36ab^2 =$

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