

Problema: AN0016 - Algebra numerica**Testo** [AN0016] [1★ 2👍 1📖] Semplifica la seguente espressione

$$(a) \quad \xi = \sqrt{72} - \frac{1}{\sqrt{2}} - \left[\left(\sqrt{3} - \frac{1}{2}\sqrt{6} \right) \cdot \frac{\sqrt{3}}{3} + 3\sqrt{2} \right]$$

$$(b) \quad \xi = \sqrt{2} \cdot (\sqrt{50} - \sqrt{8} + \sqrt{18}) + \frac{2}{\sqrt{2}} - \frac{\sqrt{15}}{\sqrt{3}}$$

$$(c) \quad \xi = \frac{1}{\sqrt{5}} + \sqrt{80} - \sqrt{45} - 2\sqrt[4]{25} + \sqrt{2} \cdot \sqrt{25}$$

$$(d) \quad \xi = \frac{2}{\sqrt[3]{4}} + \frac{\sqrt{8} - \sqrt{2}}{2\sqrt{2}} - \sqrt[3]{16}$$

$$(e) \quad \xi = \frac{\sqrt{20} + \sqrt{5}}{3\sqrt{5}} + \frac{3}{\sqrt{3}} - (\sqrt{12} - \sqrt{27}) \cdot \sqrt{3}$$

$$(f) \quad \left(\frac{1}{2} + \sqrt[4]{4} \right) \cdot \left(\frac{1}{2} - \sqrt{2} \right) - \frac{5}{\sqrt{2}} + \sqrt{18} = \frac{1}{4} - 1$$

$$(g) \quad \xi = \frac{1}{2}\sqrt{48} + \sqrt{75} - 2\sqrt{3} \cdot (1 + \sqrt{3}) + \frac{\sqrt{96}}{\sqrt{2}}$$

$$(h) \quad \frac{3}{\sqrt[3]{9}} + \sqrt[3]{24} - \sqrt[3]{3} \cdot (\sqrt[3]{8} + \sqrt[3]{9})$$

$$(i) \quad \sqrt{3} \cdot \left(\frac{\sqrt{6}}{3} - \frac{\sqrt{3}}{2} \right) + \frac{1}{2} + (\sqrt{5} + 1)(\sqrt{5} - 1)$$

$$(j) \quad \xi = \sqrt{2} \cdot \sqrt[4]{4} + \frac{4}{\sqrt{2}} - \sqrt{2} \cdot (\sqrt{2} + 1) - \frac{\sqrt{10}}{\sqrt{5}}$$

$$(k) \quad \xi = (2\sqrt{3} + \sqrt{5}) \cdot (\sqrt{3} - \sqrt{5}) + \sqrt{15}$$

$$(l) \quad \sqrt{50} + \frac{14}{\sqrt{7}} - \sqrt{98} + \sqrt[3]{5} \cdot \sqrt[3]{25}$$

$$(m) \quad \frac{\sqrt{27} - \sqrt{3}}{\sqrt{12}} + (\sqrt{5} - 2)(\sqrt{5} + 2)$$

$$(n) \quad \sqrt{45} - \sqrt{2 \cdot \sqrt{100}} + \frac{\sqrt{50}}{\sqrt{10}}$$

$$(o) \quad \sqrt{8} \cdot \left(\sqrt[4]{4} + \frac{1}{\sqrt{2}} \right) - \sqrt{3} \cdot (\sqrt{12} + \sqrt{27}) + \sqrt{75}$$

$$(p) \quad (\sqrt{6} + \sqrt{2}) \cdot (\sqrt{6} - \sqrt{2}) + (\sqrt{2} + 1)^2$$

Spiegazione Applica le proprietà dei radicali per semplificare le seguenti espressioni

Svolgimento Qui di seguito le soluzioni degli esercizi proposti

(a)

$$\xi = \sqrt{72} - \frac{1}{\sqrt{2}} - \left[\left(\sqrt{3} - \frac{1}{2}\sqrt{6} \right) \cdot \frac{\sqrt{3}}{3} + 3\sqrt{2} \right]$$

$$\xi = 6\sqrt{2} - \frac{\sqrt{2}}{2} - \left[1 - \frac{\sqrt{2}}{2} + 3\sqrt{2} \right] =$$

$$6\sqrt{2} - \frac{\sqrt{2}}{2} - 1 + \frac{\sqrt{2}}{2} - 3\sqrt{2}$$

$$3\sqrt{2} - 1$$

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(b)

$$\xi = \sqrt{2} \cdot (\sqrt{50} - \sqrt{8} + \sqrt{18}) + \frac{2}{\sqrt{2}} - \frac{\sqrt{15}}{\sqrt{3}}$$

$$\xi = \sqrt{2} \cdot (5\sqrt{2} - 2\sqrt{2} + 3\sqrt{2}) + \sqrt{2} - \sqrt{5}$$

$$\xi = \sqrt{2} \cdot (6\sqrt{2}) + \sqrt{2} - \sqrt{5}$$

$$\xi = 12 + \sqrt{2} - \sqrt{5}$$

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(c)

$$\xi = \frac{1}{\sqrt{5}} + \sqrt{80} - \sqrt{45} - 2\sqrt[4]{25} + \sqrt{2 \cdot \sqrt{25}}$$

$$\xi = \frac{1}{5}\sqrt{5} + 4\sqrt{5} - 3\sqrt{5} - 2\sqrt{5} + \sqrt{2 \cdot 5}$$

$$\xi = \left(\frac{1}{5} + 4 - 3 - 2 \right) \sqrt{5} + \sqrt{2 \cdot 5}$$

$$\xi = -\frac{4}{5}\sqrt{5} + \sqrt{2 \cdot 5}$$

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(d) $\xi = \frac{1}{2} - \sqrt[3]{2}.$

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(e)

$$\xi = \frac{\sqrt{20} + \sqrt{5}}{3\sqrt{5}} + \frac{3}{\sqrt{3}} - (\sqrt{12} - \sqrt{27}) \cdot \sqrt{3}$$

$$\xi = \frac{2\sqrt{5} + \sqrt{5}}{3\sqrt{5}} + \sqrt{3} - (2\sqrt{3} - 3\sqrt{3}) \cdot \sqrt{3}$$

$$\xi = 1 + \sqrt{3} + 3 = 4 + \sqrt{3}$$

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(f) $-\frac{3}{4}.$

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(g)

$$\xi = \frac{1}{2}\sqrt{48} + \sqrt{75} - 2\sqrt{3} \cdot (1 + \sqrt{3}) + \frac{\sqrt{96}}{\sqrt{2}}$$

$$\xi = \frac{1}{2}\sqrt{4^2 \cdot 3} + \sqrt{5^2 \cdot 3} - 2\sqrt{3} - 6 + \frac{\sqrt{3 \cdot 2^5}}{\sqrt{2}}$$

$$\xi = 2\sqrt{3} + 5\sqrt{3} - 2\sqrt{3} - 6 + \frac{2^2\sqrt{3} \cdot \sqrt{2}}{\sqrt{2}} = 9\sqrt{3} - 6$$

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(h) $\sqrt[3]{3} - 3.$

(i) $\sqrt{3} \cdot \left(\frac{\sqrt{6}}{3} - \frac{\sqrt{3}}{2} \right) + \frac{1}{2} + (\sqrt{5} + 1)(\sqrt{5} - 1)$
 $\sqrt{3} \cdot \frac{2\sqrt{6} - 3\sqrt{3}}{6} + \frac{1}{2} + 5 - 2\sqrt{5} + 2\sqrt{5} - 1$
 $\frac{6\sqrt{2} - 9}{6} + \frac{9}{2}$
 $\sqrt{2} - \frac{3}{2} + \frac{9}{2}$
 $\sqrt{2} + 3.$

(j) $\xi = \sqrt{2} \cdot \sqrt[4]{4} + \frac{4}{\sqrt{2}} - \sqrt{2} \cdot (\sqrt{2} + 1) - \frac{\sqrt{10}}{\sqrt{5}}$
 $\xi = \sqrt{2} \cdot \sqrt{2} + 2\sqrt{2} - 2 - \sqrt{2} - \sqrt{2} = 0.$

(k) $\xi = 1.$

(l) $5 + 2\sqrt{7} - 2\sqrt{2}.$

(m) $2.$

(n) $2\sqrt{5}.$

(o) $5\sqrt{3} - 9.$

(p) $7 + 2\sqrt{2}.$
