Soluzioni ai tutorati

Corso di Fisica - CdL in Informatica

26 marzo 2018

Soluzioni

- Tutorato 1: Calcolo Vettoriale

  1. $\|\vec{v}\| = \sqrt{58}$, $\|\vec{u}\| = \sqrt{41}$, $\vec{s} = (7, 12)$, $\vec{u} \cdot \vec{v} = \vec{v} \cdot \vec{u} = 47$, $\vec{v} \cdot \vec{v} = 58$
  2. $\vec{v} = (15.3, -79°)$, $\vec{u} = (9, 0°)$
  3. $\|\vec{v}\| = 11.2$, $\|\vec{u}\| = 13.6$, $\|\vec{u} + \vec{v}\| = 22.7$
  4. $\|\vec{u} \times \vec{v}\| = 3$
  5. ragionamento
  6. $\|\vec{u} \times \vec{v}\| = 0$, $\vec{u} \cdot \vec{v} = 30$
  7. $\vec{d} = (2, 5) = (5.4, 68°)$, $\theta = 3.4°$
  8. $\vec{r_{AB}} = (12, -5)$, $\|\vec{r_{AB}}\| = 13$
  9. $\vec{r_{AB}} = (4, -3)$, $\vec{r_{AC}} = (4, 0)$, $\vec{r_{AB}} \cdot \vec{r_{AC}} = 16$
  10. $\vec{s} = (3, 3)$, $\vec{d} = (1, -1)$

- Tutorato 2: Elettrostatica 1

  1. $F_e = 89.88 N$
  2. $q = 1.5 \times 10^{-5} r$
  3. $E_r = 9 \times 10^5 \, N \cdot C^{-1}$, $E_{2r} = 2.2 \times 10^5 \, N \cdot C^{-1}$
  4. $q = 1.2 \times 10^{-8} \, C$
  5. $L = 6 \times 10^{-5} \, J$
  6. $F_g = 3.6 \times 10^{-47} \, N$, $F_e = 8.2 \times 10^{-8} \, N$

- Tutorato 3: Elettrostatica 2

  1. $r = 23 \, cm$
  2. $q_1 = 1 \times 10^{-6} \, C$, $q_2 = 2 \times 10^{-6} \, C$
  3. $\vec{F_e} = (0, 7.32) \, N$
  4. $\epsilon_r = 24$
  5. $\vec{F_e} = (0, 5.1) \, N$
  6. $r = 6.7 \, m$
  7. $E = 108 k N \cdot C^{-1}$
  8. $L = 5 \times 10^{-4} \, J$
  9. q = 48.5 nC
  10. $0 \, J$, $-10^{-3} \, J$, $2.3 \times 10^{-3} \, J$

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- Tutorato 4: Elettrostatica 3

    1. $E_x = kxQ/(x^2 + a^2)$
    2. $E_x = -2.16 \times 10^7 \ N \cdot C^{-1}$
    3. $E = \frac{\sigma}{2\epsilon_0} \left(1 - x/\sqrt{x^2 + R^2}\right)$
    4. Interno: $E = 0$, Esterno: $E(r) = \sigma R^2/r^2 \epsilon_0$
    5. Interno: $E(r) = \rho r/3\epsilon_0$, Esterno: $E(r) = \rho R^3/3r^2 \epsilon_0$

- Tutorato 5: Elettrostatica 4

    1. $C = 9.63 \, pF$, $V = 6.9V$
    2. $\epsilon_r = 2$
    3. $V = 1.6kV, Q = 3 \, C$
    4. $\Delta V = 8.6 \, V$, $\rho_E = 2 \cdot 10^{-5} J/m^3$

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