Zadaci - Brzina i put kod RPPK (treći deo)

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Zadaci - Brzina i put kod RPPK

7. Automobil je imao brzinu $20\frac{m}{s}$ kada je počeo da ubrzava. Ako je njegovo ubrzanje $2\frac{m}{s^2}$ koliku brzinu će imati nakon 800m?

$$v_0 = 20\ \frac{m}{s}$$

$$a = 2\ \frac{m}{s^2}$$

$$S = 800m$$

$$v = ?$$

$$v^2 = v_0{}^2 + 2 \cdot a \cdot S$$

$$v^2 = \left(20\ \frac{m}{s}\right)^2 + 2 \cdot 2\ \frac{m}{s^2} \cdot 800\text{m}$$

$$v^2 = 400\left(\frac{m}{s}\right)^2 + 3200\left(\frac{m}{s}\right)^2$$

$$v^2 = 3600\left(\frac{m}{s}\right)^2$$

$$v = \sqrt{3600\left(\frac{m}{s}\right)^2}$$

$$v = 60\ \frac{m}{s}$$

Zadaci - Brzina i put kod RPPK

8. Telo se kreće ravnomerno usporeno usporenjem $4 \frac{m}{s^2}$. Koliki put pređe dok mu se brzina smanji sa $5 \frac{m}{s}$ na $2 \frac{m}{s}$?

$$a = 4 \frac{m}{s^2}$$

$$v_0 = 5 \frac{m}{s}$$

$$v = 2 \frac{m}{s}$$

$$S = ?$$

$$v^2 = {v_0}^2 - 2 \cdot a \cdot S$$

$$2 \cdot a \cdot S = {v_0}^2 - v^2$$

$$S = \frac{{v_0}^2 - v^2}{2 \cdot a}$$

$$S = \frac{\left(5 \frac{m}{s}\right)^2 - \left(2 \frac{m}{s}\right)^2}{2 \cdot 4 \frac{m}{s^2}} = \frac{25 \left(\frac{m}{s}\right)^2 - 4 \left(\frac{m}{s}\right)^2}{8 \frac{m}{s^2}}$$

$$S = \frac{21 \left(\frac{m}{s}\right)^2}{8 \frac{m}{s^2}} = \frac{21 \frac{m^2}{s^2}}{8 \frac{m}{s^2}} = 2,625 m$$

Zadaci - Brzina i put kod RPPK

9. Bozač pri brzini $25 \frac{m}{s}$ ugledavši semafor počinje da usporava usporenjem $5 \frac{m}{s^2}$ i na kraju se zaustavi. Koliki je zaustavni put automobirla?

$$a = 5 \frac{m}{s^2}$$

$$v_0 = 25 \frac{m}{s}$$

$$v = 0 \frac{m}{s}$$

$$S = ?$$

$$v^2 = v_0{}^2 - 2 \cdot a \cdot S$$

$$2 \cdot a \cdot S = v_0{}^2 - v^2$$

$$S = \frac{v_0{}^2 - v^2}{2 \cdot a}$$

$$S = \frac{\left(25 \frac{m}{s}\right)^2 - \left(0 \frac{m}{s}\right)^2}{2 \cdot 5 \frac{m}{s^2}} = \frac{625 \left(\frac{m}{s}\right)^2 - 0 \left(\frac{m}{s}\right)^2}{10 \frac{m}{s^2}}$$

$$S = \frac{625 \left(\frac{m}{s}\right)^2}{10 \frac{m}{s^2}} = \frac{625 \frac{m^2}{s^2}}{10 \frac{m}{s^2}} = 62,5m$$