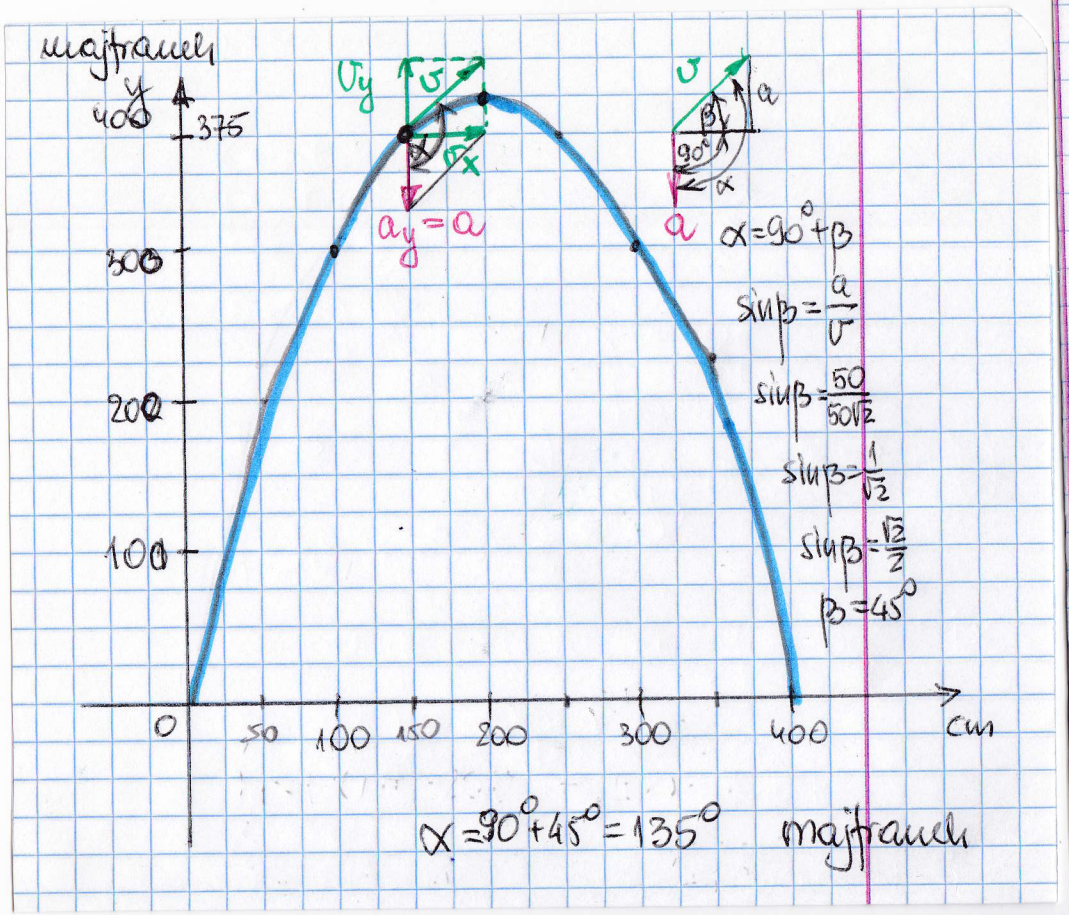

majtrauek

Dane:

$x = a \cdot t$

$y = bt - ct^2$

$a = 50 \frac{cm}{s}$

$b = 200 \frac{cm}{s}$

$c = 25 \frac{cm}{s^2}$

$t = 3s$

Szukane:

v

a

α

$$\begin{cases} x = 50t \\ y = 200t - 25t^2 \end{cases}$$

$t = \frac{x}{50}$

$y = 200 \cdot \frac{x}{50} - 25 \cdot \left(\frac{x}{50}\right)^2$

$y = 4x - 25 \cdot \frac{x^2}{2500}$

Równanie toru ruchu: $y = -\frac{1}{100}x^2 + 4x$

$v_x = (50t)' = 50$

$v_y = (200t - 25t^2)' = 200 - 50t$

$v = \sqrt{v_x^2 + v_y^2} = \sqrt{50^2 + (200 - 50t)^2}$

$a_x = v_x' = 50' = 0$

$a_y = v_y' = (200 - 50t)' = -50$

$a = \sqrt{a_x^2 + a_y^2} = \sqrt{0^2 + (-50)^2} = \sqrt{2500} = 50 \frac{m}{s^2}$

dla $t = 3s$ $x = 150cm$ $y = 200 \cdot 3 - 25 \cdot 3^2$

$y = 600 - 225$

$y = 375cm$

$v = \sqrt{2500 + (200 - 50 \cdot 3)^2}$

$v = \sqrt{2500 + 2500} = \sqrt{2500 \cdot 2} = 50\sqrt{2}$

$v_x = 50 \frac{cm}{s}$ $v_y = 200 - 50 \cdot 3 = 50 \frac{cm}{s}$

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