

PAG. 522 N 82



DALL'ALTO

Diagram showing the car's path from above. The car is moving at 300 km/h and has a mass $m = 600 \text{ kg}$. The track has a 40 m wide section. The car is moving along a curved path with a radius of 30 m . The angle between the horizontal and the path is 20° . The vertical distance from the center of the curve to the car is labeled 40 m and **BRACCIO**.

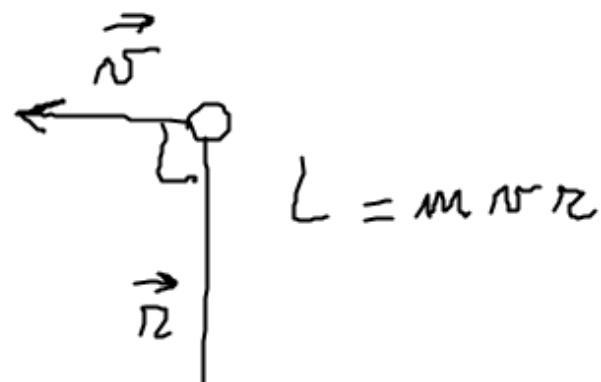
$$L = \underbrace{r \cdot \sin \theta}_{40 \text{ m}} \cdot m v =$$

$$v = 300 \frac{\text{km}}{\text{h}} = \frac{300}{3,6} \frac{\text{m}}{\text{s}}$$

$$= (40 \text{ m}) (600 \text{ kg}) \left(\frac{300}{3,6} \frac{\text{m}}{\text{s}} \right) = 2,0 \times 10^6 \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2}$$

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$$R = 50 \text{ cm} = 0,50 \text{ m}$$



$$v_2 = v_1 + 10\%$$

DALTA CONS. DEL
MOMENTO ANGOLARE

$$v_2 = \frac{11}{10} v_1$$

~~$$m R v_1 = m (R - \Delta R) v_2$$~~

~~$$R v_1 = (R - \Delta R) 1,1 v_1$$~~

$$\frac{R}{1,1} = R - \Delta R$$

$$\Delta R = R - \frac{R}{1,1} = \frac{1,1R - R}{1,1} =$$

$$= \frac{0,1}{1,1} R = \frac{0,1}{1,1} 50 \text{ cm} \approx 4,5 \text{ cm}$$

$$v = \omega R$$

$$\omega = \frac{v}{R}$$

$$\omega_2 = 1,1 \omega_1$$

$$\frac{v_2}{R_2} = 1,1 \frac{v_1}{R_1}$$

$$v_2 = 1,1 v_1 \frac{R_2}{R_1}$$

~~$$m v_1 R_1 = m v_2 R_2$$~~

~~$$v_1 R_1 = 1,1 v_1 \frac{R_2}{R_1} R_2$$~~

$$R_1^2 = 1,1 R_2^2$$

$$R_2 = \sqrt{\frac{R_1^2}{1,1}} =$$

$$= \frac{50 \text{ cm}}{\sqrt{1,1}} =$$

$$= 47,67 \text{ cm}$$

$$\Delta R = 50 \text{ cm} - 47,67 \text{ cm} \approx 2 \text{ cm}$$