

Answer on Question#38500 – Physics - Mechanics | Kinematics | Dynamics

Calculate tension(centripetal force) of the rope with a stone at its end. Mass of the stone is 2 kg, length of the rope is 5 m, the stone velocity is 10 m/2

Solution:

$m = 2\text{kg}$ – mass of the stone;

$l = 5\text{m}$ – length of the rope;

$V = 10 \frac{\text{m}}{\text{s}}$

Formula for the centripetal force:

$$F = ma_c = m \frac{V^2}{l} = 2\text{kg} \cdot \frac{\left(10 \frac{\text{m}}{\text{s}}\right)^2}{5\text{m}} = 40\text{N}$$

Answer: centripetal force of the rope is equal to 40N.