

Answer on Question#40943 – Physics - Mechanics | Kinematics | Dynamics

A stone is tied to a 0.5-m string and whirled at a constant speed of 4.0m/s in a vertical circle. Its acceleration at top of the circular path is:

- A. 9.8 m/s², up
- B. 9.8 m/s², down
- C. 8.0 m/s², up
- D. 32 m/s², down
- E. 32 m/s², up

Solution:

Centripetal acceleration of the stone at top of the circular path:

$$a_c = \frac{v^2}{r} = \frac{\left(4 \frac{m}{s}\right)^2}{0.5m} = 32 \frac{m}{s^2}$$

Centripetal acceleration directed towards the center of the circle, thus in the top of the circular path is will be directed downward.

Answer: D. 32 m/s², down.