

**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/s<sup>2</sup>, up
- B. 9.8 m/s<sup>2</sup>, down
- C. 8.0 m/s<sup>2</sup>, up
- D. 32 m/s<sup>2</sup>, down
- E. 32 m/s<sup>2</sup>, up

**Solution:**

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

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

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/s<sup>2</sup>, down.