Quiz 1c

Note Title 26/01/2012

A boy is whirling a rock attached to a string overhead in a horizontal circle. The rock makes a complete loop in 0.50 s and the string is 0.60 m long.

a. Find the speed of the rock

b. Find the centripetal acceleration of the rock.

c. If both the speed and radius of the rock are doubled what happens to the acceleration?

a.) $v = \frac{2\pi r}{T} = \frac{2\pi(0.60)}{0.50} = \boxed{7.53 \text{ m/s}}$ ✓

b.) $a_c = \frac{v^2}{r} = \frac{(7.53)^2}{(0.60)} = \boxed{95 \text{ m/s}^2}$ ✓

c.) $a_{c_1} = \frac{v_1^2}{r_1}$ $\quad a_{c_2} = \frac{(2v_1)^2}{2r_2} = \frac{4v_1^2}{2r_1} = 2a_{c_1}$

$\therefore \; a_{c_2} = 2a_{c_1}$ ✓