



WEEK: _____

PROBLEM: _____

GIVEN:

The bar rotates in the x - y plane with constant angular velocity $\omega_0 = 12$ rad/s. The radial component of acceleration of the collar C (in m/s^2) is given as a function of the radial position in meters by $a_r = -8r$. When $r = 1$ m, the radial component of velocity of C is $v_r = 2$ m/s. Determine the velocity of C in terms of polar coordinates when $r = 1.5$ m.

Strategy: Use the chain rule to write the first term in the radial component of the acceleration as

$$\frac{d^2r}{dt^2} = \frac{dv_r}{dt} = \frac{dv_r}{dr} \frac{dr}{dt} = \frac{dv_r}{dr} v_r$$

REQUIRED:**SOLUTION:**