6. An object is traveling around circular path with a constant radius. If the period of object was doubled, how would each of the following change...(indicate by how much would it change ie. double quadruple, half, quarter...)

A. Circular speed

$$T = 2T_i \qquad V = \frac{2\pi r}{T} \rightarrow \frac{(1)}{(2)} = \boxed{\frac{1}{2}}$$

B. Centripetal acceleration

$$V = \frac{1}{2}V_i \qquad a_c = \frac{V^2}{r} = \frac{\left(\frac{1}{2}\right)^2}{(1)} = \boxed{\frac{1}{4}}$$

II. Centripetal Force

1. A 1.5 kg cart moves in a circular path of 1.3 m radius at a constant speed of 2 m/s.

(a) Calculate the magnitude of the centripetal acceleration of the cart.

$$a_c = \frac{V^2}{r} = \frac{(2m/s)^2}{1.3m} = \boxed{3.08 \, m/s^2}$$

(b) Calculate the magnitude of the centripetal force on the cart.

$$F_c = Ma_c = (1.5Kg)(3.08m/s^2) = \boxed{4.62N}$$

(c) Calculate the coefficient of friction between the tires and the ground

$$F_c = F_f$$

$$F_f = \mu F_N \rightarrow \mu = \frac{F_f}{F_N} = \frac{4.62N}{14.7N} = \boxed{0.314}$$

$$F_N = F_g = mg = (1.5Kg)(9.8m/s^2) = 14.7N$$

(d) Describe the direction of the centripetal force.

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