**Centripetal acceleration & Force problems**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_Period: \_\_\_\_\_\_\_\_\_

$a\_{c}=\frac{v^{2}}{r}=\frac{4π^{2}r}{T^{2}}$ $F\_{C}=ma\_{c}$ $v=\frac{d}{t}=\frac{2πr}{T}$

1. An airplane is moving on a circular path of radius 2 km with a constant speed of 1000km/h. Calculate its centripetal acceleration in m/s2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. A rope attached a tire to an overheating tree limb. A girl swinging on the tire has a centripetal acceleration of 3m/s2. If the length of the rope is 2,1m, what is the girl’s tangential speed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. As Aymá swings a 0.5kg yo-yo parallel to the ground and above his head, the yo-yo has centripetal acceleration of 250m/s2. If the yo-yo’s string is 0.50m long,

a. What is the yo-yo’s tangential speed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What is the centripetal force? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. A 20,000g dog sits 1.5m from the center of a merry-to-round. The merry-go-round is set in motion, and the dog’s tangential speed is 1.5m/s.

a. What is dog’s centripetal acceleration? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What is the dog’s centripetal force? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. A race car moving along a circular track has a centripetal acceleration of 15.4m/s2. If the car has a tangential speed of 30m/s, what is the distance between the car and the center of the track? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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