AP Physics 1: Rotation Introduction

1. Convert the following angle measurements to radians:

a. 30.0o b. 90.0o c. 360.0o d. 55o e. 999o f. 16o g. 233o

2. Convert the following angle measurements to degrees:

a. 22.2 rad b. 1.0 rad c. 4.9 rad d. 0.14 rad e. 114 rad f. 11.4 rad g. 0.080 rad

3. A mass is traveling around a circle with a radius of 40.0cm. Find the distance travelled by the mass after it has travelled through the following:

a. one tenth of a circle. b. ¼ of a circle c. 0.88 of a circle d. 2.6 circles

3. A mass is traveling around a circle with a radius of 40.0cm. Find the distance travelled by the mass after it has travelled through the following angles:

a. 62o b. 90o c. 280o d. 440o e. 12o f. 230o g. 820o

4. A mass is traveling around a circle with a radius of 40.0cm. Find the distance travelled by the mass after it has travelled through the following angles:

a. 4.0 rad b. 6.2 rad c. 0.72 rad d. 1.0 rad e. 2.2 rad f. 90 rad g. 7.5 rad

5. A mass is traveling around a circle with a radius of 40.0cm. For each of the following linear distances travelled, what is the magnitude of the angular displacement, θ, in radians?

a. 40.0 cm b. 80.0 cm c. 35 cm d. 1.1 m e. 5.0 m f. 11 m g. 6.2 m

6. A mass travels in a circular path with a radius of 5.0m at 4.0m/s. Over a time of 3.0s find:

a. The distance travelled.

b. The angular displacement in radians.

7. The turntable shown below rotates at 45 rpm.

Point A is 19cm from the center

point B is 28cm from the center.

θ

A B

a. Find the speed of A and B.

b. Find the angular speed of A and B.

8. A bicycle has wheels with a radius of 52cm. The wheels initially rotate at 16.0 rad/s the rider slows until the angular speed is 3.0 rad/s is 4.0s.

a. Find the angular acceleration of the wheels.

b. Find the linear acceleration of the bicycle.