

PENANG SANGAM HIGH SCHOOL
YEAR 13 PHYSICS
WORKSHEET 5

1. Kinetic Friction is when
 - A. Object is falling
 - B. Object is stationary
 - C. Object is accelerating
 - D. Object is at rest

2. Which of the following is analogous to torque in linear motion?
 - A. Mass
 - B. Force
 - C. Momentum
 - D. Acceleration

3. Which of the following is correct for a Ferris wheel at the bottom of a ride
 - A. $T = F_C$
 - B. $T = F_C - W$
 - C. $T = F_C + W$
 - D. $T = W$

4. When a cat sleeps on a table, the net force on it is
 - A. zero
 - B. directed upward
 - C. directed downward
 - D. directed in the horizontal direction

5. Ferris wheel is an example that is used in Year 13 Physics to study the concept of
 - A. force
 - B. energy
 - C. Horizontal circle
 - D. Vertical circle

6. In an unbanked road, the factor that does not describe the maximum speed with which a car can travel safely is
 - A. acceleration due to gravity
 - B. radius of the curve
 - C. coefficient of friction between the tyre and the road
 - D. Mass of the car

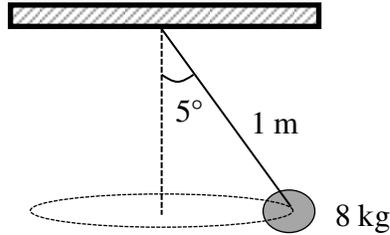
7. Which of the following correctly states the unit for angular displacement, θ .
 - A. rev
 - B. rad
 - C. rad / s
 - D. rad / s²

8. A conical pendulum with an 8 kg bob on a 1 m wire making an angle of 5° with the vertical as shown in the diagram below.

Determine the:

- (i) tension in the string.

$$\cos \theta = \frac{mg}{T}$$



Hint: Use the Triangle:

- (ii) velocity of the 8kg bob.

$$\text{Use } V = \sqrt{rg \tan \theta}$$

9. The spinner of a washing machine turning at 30 rad s^{-1} and increasing to 90 rad s^{-1} makes 40 revolutions. **Hint: use rotational equations of motion**

Find the:

- (i) total angle turned through in radians.
 (ii) angular acceleration
 (iii) time taken to turn through the 40 revolutions.

10. At what angle should the curve be banked so that the designated speed is 10.3 ms^{-1} and the radius of the curve is 46.0 m.

$$\text{Use: } v^2 = r g \tan \theta$$

11. The London Eye is one of the largest Ferris wheels on earth. It has a diameter of 100 m and rotates at a rate of about 20rad/s. Given that it moves at a constant speed, find the:

(i) centripetal force on a passenger of mass 55 kg.

Use : $F_c = mr \omega^2$

(ii) reaction force from the seat when the passenger is at the top of the circle.

Use: $R = mg - F_c$

(iii) reaction force from the seat when the passenger is at the bottom of the circle.

$R = mg + F_c$