UNIT G484	Module 2	4.2.1	Circular Motion

- **PRACTICE QUESTIONS (1)**

1 Calculate the ***angular displacement*** of the tip of the ***minute*** hand on a watch in (i) ***Degrees*** and (ii) ***Radians,*** in a time of :

(a) 5 minutes, (b) ***15 minutes,*** (c) ***1 hour.***

2 (a) Calculate the number of ***radians*** in : (i) ***60°***, (ii) ***145°.***

(b) Calculate the number of ***degrees*** in : (i) ***0.8 radian.***
(ii) ***π/4 radian.***

(c) Express ***30°, 60°*** and ***90°*** as multiples of π radians.

3 The wheels on a racing car turn at a frequency of ***10 Hz.*** Calculate :

(a) The ***time period (T).***

(b) The ***angular displacement in radians*** in a time of :

(i) ***25 ms,*** (ii) ***100 ms.***

4 At some point in the past, when the Earth was in its initial stages of formation, it took ***18 hours*** to complete one revolution about its axis. Given that the Earth's diameter is ***12800 km,*** calculate :

(a) The ***speed of rotation*** of a point on the equator.

(b) The ***angular displacement*** of this point in a time of ***30 minutes,*** (i) in ***radians*** and (ii) in ***degrees.***

5 Cyclists racing in the Olympic Velodrome often reach speeds of ***18 m s^{-1}*** on bikes having wheels of diameter ***700 mm.*** ***3***

Calculate :

(a) The ***time taken for one complete revolution*** of the wheels.

(b) (i) The ***rotational frequency*** of the wheels.

(ii) The ***number of complete revolutions*** made by the wheels in ***4 minutes.***

(iii) The ***distance travelled*** by the cyclist in ***4 minutes.***

6 The Earth has an orbits the Sun at an average radius of ***1.5×10^{11} m.*** Given that it completes its orbit in ***365.3 days***, calculate the Earth's orbital :

(a) ***Frequency.***

(b) ***Linear speed.***

(c) ***Angular speed in radians per second.***