Section 5.1 (Word problems)

1) **A central angle in a circle of radius 4 cm is 75^o. Find the length of the intercepted arc in cm. (Ans: $\frac{5\pi}{3}$)**
2) **Find the area of a sector in square cm of a circle of a radius 6 cm if the central angle is 60^o. (Ans: 6π)**
3) **The area of a sector of a circle with radius 6 cm is 15 square cm. Find the measure of the central angle of the sector in degrees. (Ans: $\frac{150}{\pi}$)**
4) **The area of a sector of a circle with diameter 8 cm is $\frac{16\pi}{3}$ square cm. Find the measure of the central angle of the sector in degrees. (Ans: 120)**
5) **Find the area of a circular sector in square cm with angle 15^o if the length of the intercepted arc is $\frac{\pi}{2}$ cm. (Ans: $\frac{3\pi}{2}$)**
6) **A 40 -inch pendulum swings through an angle of 18^o. Find the length of the arc in inches through which the tip of the pendulum swings. (Ans: 4π)**
7) **A point on the rim of a wheel is rotating with angular speed of 110 revolution per second. If the wheel's diameter is 15 feet, find the linear speed in ft/sec. (Ans: 1650π)**
8) **A motorcycle is traveling on a curve along a highway. The curve is an arc of a circle with radius of $\frac{1}{4}$ miles. If the motorcycle's speed is 42 mph, what is the angle in radians through which the motorcycle will turn in $\frac{1}{2}$ minute. (Ans: $\frac{7}{5}$)**
9) **The outer diameter of the wheels on a bicycle is 22 inches. If the wheels are turning at a rate of 240 rpm. Find the linear speed of the bike in inches per minute.(Ans: 5280π)**
10) **A wheel is rotating at 50 rpm. Find the angular speed in radians per second. (Ans: $\frac{5\pi}{3}$)**
11) **An object is traveling around a circle with diameter 6 cm. If in 12 seconds a central angle of $\frac{1}{3}$ radian is swept out, a) what is the angular speed of the object? b) what is it's linear speed?**

    [Ans: a) $\frac{1}{36}$ rad/sec b) $\frac{1}{12}$ cm/sec]
12) **The windshield wiper of a car is 24 inches long. How many inches will the tip of the wiper trace out in $\frac{1}{4}$ revolution? (Ans: 12π)**
13) **A neighborhood carnival has a Ferris wheel whose radius is 30 feet. You measure the the time it takes for one revolution to be 70 seconds. a)What is the angular speed in radians per second? b) what is the linear speed in ft/sec? (Ans: a) $\frac{\pi}{35}$ b) $\frac{6\pi}{7}$)**
14) **An object is traveling around a circle with radius 9 cm. If in 15 seconds a central angle of 75^o is swept out, a) what is the angular speed of the object? b) what is it's linear speed?**

    [Ans: a) $\frac{\pi}{36}$ rad/sec b) $\frac{\pi}{4}$ cm/sec]