A circular disk has a diameter of 18 cm. If the angular velocity of the disk about its central axis is 8 rev/s:

a) Find the linear speed of a point on the rim of the disk
b) What is the total distance travelled by the point in 50 mins?

Given:

Diameter of the disk = 18 cm = 0.18m
Radius of the disk r = 0.09 m
Number of revolutions per second f = 8 rev/s

a) Determine: linear speed of a point on the rim of the disk: v

Use formula:
$$v = r\omega \text{ —————————————(1)}$$

Here ω is the angular velocity of the disk in rad / s.
Use Formula: $\omega = 2\pi f$

Substituting for ω in (1):
$$v = r \times (2\pi\, f) = 0.09 \times 2 \times 3.14 \times 8 = 4.5 \text{ m/s}$$

b) Determine: Distance travelled by the point in 50 mins or 3000-s: S

Use formula:
$$S = vt \text{ ————————(2)}$$

Substituting for v from (a) and t :
$$S = 4.5 \times 3000 = 13500 \text{ m} = 13.5 \text{ km}$$