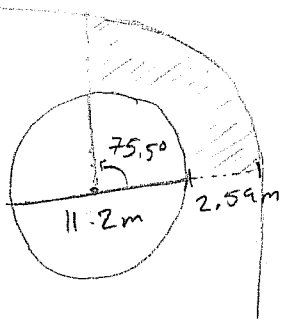
Name: SOLUTIONS

Student ID: _____

Quiz 7

Question 1. *(6 marks)* Part of a security fence is built2.59m from a cylindrical storage tank 11.2 m in diameter. What is the area between the tank and this part of the fence if the central angle of the fence is 75.5°?



RADIUS OF SMALL CIRCLE $= \frac{11.2}{2} = 5.60$

RADIUS OF LARGE CIRCLE $= 5.60 + 2.59 = 8.19$

AREA OF SHADED REGION

$= (\text{AREA OF LARGE SECTOR}) - (\text{AREA OF SMALL SECTOR})$

$= \frac{1}{2}(75.5°)\left(\frac{\pi}{180°}\right)(8.19)^2 - \frac{1}{2}(75.5°)\left(\frac{\pi}{180°}\right)(5.60)^2$

$A = \frac{1}{2}\theta r^2$

$= 44.19387449 - 20.66190582$

$= 23.5\,m^2$

Question 2. *(4 marks)* A DVD has a diameter of 12.1 cm and rotates at 360.0 r/min. What is the linear velocity of a point on the outer edge?

$v = \omega r$, $\omega = \left(360.0\frac{r}{min}\right)\left(\frac{2\pi\ rad}{1\ r}\right) = 2261.946711\ \frac{rad}{min}$

$\therefore v = (2261.946711)\left(\frac{12.1}{2}\right) = 13700\,cm/min$

$= 137\,m/min$

or

$= 228\,cm/s$