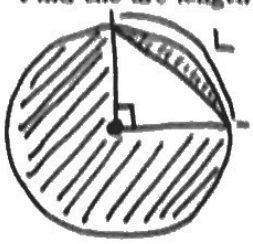
MA 202: Quiz 6

Tuesday 02/27/2018

Name Solution Key **Section** _____

1. (3 points.) Consider the figure below. The circle has a diameter of 8m with marked center. Find the arc length L and the area of the shaded region. Give exact answers.



$$L = \left(\frac{\theta}{360}\right) 2\pi r = \frac{\theta}{180} \cdot \pi d = \frac{90}{180} \cdot \pi \cdot 8 = \frac{1}{2} \cdot \pi \cdot 4 = \boxed{2\pi \text{ m}}$$

$$\begin{aligned} A_{\text{shaded}} &= A_{\odot} - A_{\triangle} \\ &= \pi r^2 - \tfrac{1}{2} bh \\ &= \pi (4)^2 - \tfrac{1}{2}(4)(4) \\ &= \boxed{16\pi - 8 \text{ m}^2} \end{aligned}$$

2. (3 points.) Suppose you have a (right circular) cylinder of radius 10 cm and height 30 cm. Which will increase the surface area of the cylinder more, doubling the radius to 20 cm or doubling the height to 60 cm? Justify your answer.

$SA = 2\pi r^2 + 2\pi r h$.

Doubling the radius will increase the SA more, since it quadruples the area of the bases and doubles the lateral area, while doubling the height only doubles the lateral area.