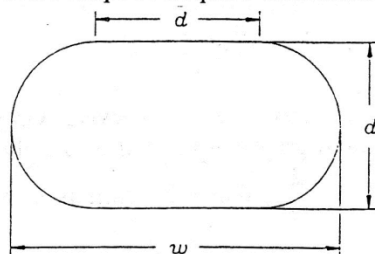


3. The cross-section of an air-conditioning duct is in the shape of a square with semicircles on two opposite sides, as shown in the diagram below.



- (a) Express the cross sectional area of the duct as a function of the diameter, d , of the circular part. [2 marks]

$$A(d) = \underline{\hspace{2cm}}$$

- (b) If the maximum allowable width, w , of the duct is 100 cm, what are the domain and range of the function found in part (a)? Remember to include units for both the domain and range. [4 marks]

Domain:

Range: