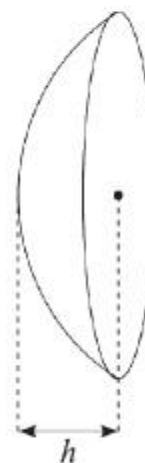
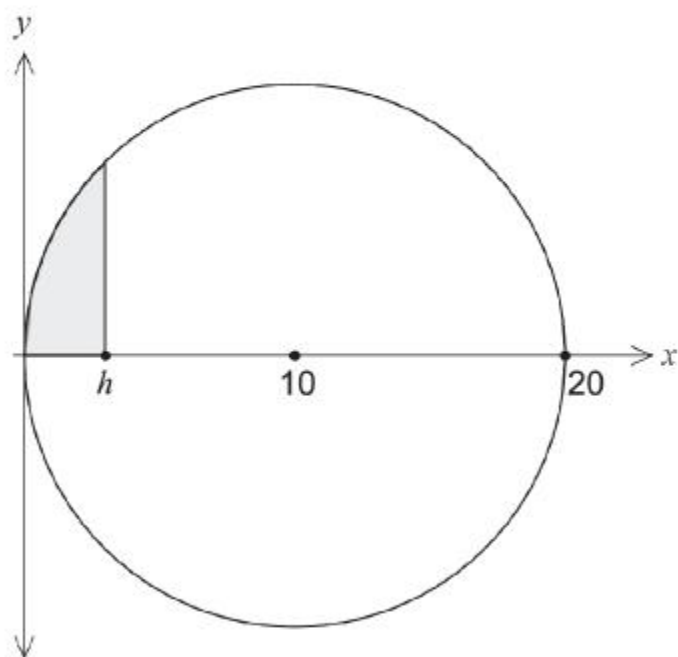


Question 13**(5 marks)**

A solid spherical cap with depth h is part of a solid sphere with radius 10 cm. This cap can be generated by revolving the shaded region about the x axis.



- (a) Show that the equation for the circle shown above is $x^2 + y^2 = 20x$. (1 mark)

Four different confidence intervals (A, B, C and D) are obtained for the mean amount spent via online shopping by Perth residents in December 2020.

Confidence interval	Sample size	Sample standard deviation	Confidence level
A	n	s	95%
B	n	s	99%
C	$2n$	s	95%
D	n	$0.8s$	95%

- (e) Which of the confidence intervals (A, B, C or D) contains μ , the population mean expenditure for online shopping in December 2020? Justify your answer. (2 marks)
- (f) For each of the following, state the confidence interval that has the smaller width. Justify your answers.

- (b) Determine the horizontal acceleration, correct to the nearest 0.001 m/s^2 , when the horizontal displacement is 10 metres. (3 marks)

(b) Hence determine $\int \frac{7x^2 - 12x + 2}{(x - 2)(x^2 + 2)} dx$. (3 marks)