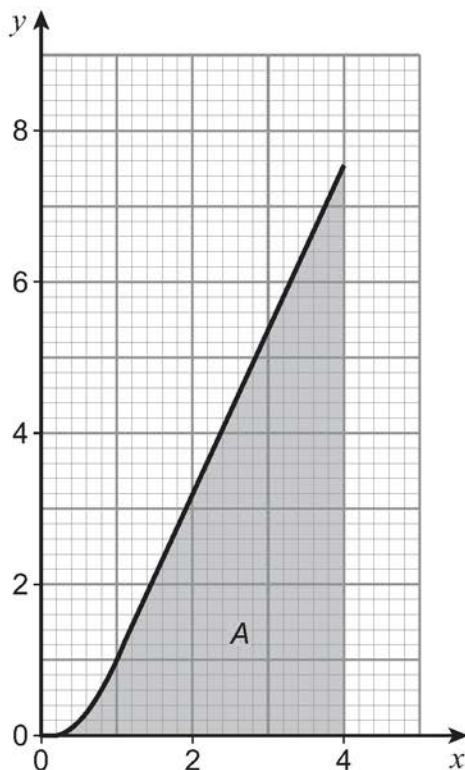


14

The graph of $y = \frac{2x^3}{x^2 + 1}$ is shown for $0 \leq x \leq 4$



Caroline is attempting to approximate the shaded area, A , under the curve using the trapezium rule by splitting the area into n trapezia.

14 (a) When $n = 4$

14 (a) (i) State the number of ordinates that Caroline uses.

[1 mark]

14 (a) (ii) Calculate the area that Caroline should obtain using this method.

Give your answer correct to two decimal places.

[3 marks]

14 (b) Show that the exact area of A is

$$16 - \ln 17$$

Fully justify your answer.

[5 marks]

14 (c) Explain what would happen to Caroline's answer to part (a)(ii) as $n \rightarrow \infty$

[1 mark]