

- (a) (i) It is required to use the Trapezium's rule to evaluate $\int_{\theta}^{\pi/2} \sin^2 x dx$ to four decimal place accuracy. Use the error bound formula to recommend the number of panel n.
- (ii) Find the Trapezium rule approximation of the integral with n=2 and compare with the exact value. Does this result contradict your part (a) answer?

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- (b) The initial-value problem is given by

$$\frac{dy}{dx} = x + \sqrt{y}, \quad y(0) = 1.$$

Use Runge-Kutta's method with step size $h = 0.1$ to find the value of $y(0.1)$ correct to 3 decimal places.