

# Page 440, #30

## 1 p440, #30, §1 Asked

Asked: The area below  $y = \sin x^2$  for  $0 \leq x \leq 1$ .

## 2 p440, #30, §2 Identification



$$\int_0^1 \sin x^2 dx$$

Analytically?

Approximate  $\sin x^2$  using a Taylor series.

## 3 p440, #30, §3 Finish

$$\begin{aligned} \int_0^1 \sin x^2 dx &= \int_0^1 \frac{x^2}{1!} - \frac{x^6}{3!} + \frac{x^{10}}{5!} + \dots \\ &= \frac{1}{3} - \frac{1}{3!7} + \frac{1}{5!11} \\ &= .3103 \pm 0.0008 \end{aligned}$$