

**TG 4** Suppose that 45% of all HSC students exercise at least four days each week. If a random sample of 50 students is taken, what is the probability that at least 80% of them exercise at least four days per week?

$$n = 50$$

$$P(\text{exercise}) = p = 0.45$$

$$\begin{aligned} np &= 50 \times 0.45 \\ &= 22.5 \end{aligned}$$

$$\mu_{\hat{p}} = p = 0.45$$

$$\begin{aligned} \sigma_{\hat{p}} &= \sqrt{\frac{p(1-p)}{n}} \\ &= \sqrt{\frac{0.45(1-0.45)}{50}} \\ &= 0.0704 \text{ (4 dec pl)} \end{aligned}$$

$$\begin{aligned} z &= \frac{X - \mu}{\sigma} \\ &= \frac{0.8 - 0.45}{0.0704} \end{aligned}$$

$$= 4.97 \text{ (2 dec pl)}$$

With a z-score of 4.97 the probability is approximately 0.

\* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by NESA.

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