

Solutions

Each answer shows the steps, then the **result**.

2.1

- $\lim_{b \rightarrow \infty} \int_1^b x^{-3} dx$

2.2

- $\left[-\frac{1}{2x^2}\right]_1^b = -\frac{1}{2b^2} + \frac{1}{2}$; as $b \rightarrow \infty$ this $\rightarrow \frac{1}{2}$

2.3

- Diverges — $p = \frac{1}{2} \leq 1$

3.1 C

- converges for $p > 1$

3.2

(a)

- $\lim_{b \rightarrow \infty} \int_0^b e^{-x} dx$

(b)

- $\left[-e^{-x}\right]_0^b = -e^{-b} + 1$; $\rightarrow 1$ as $b \rightarrow \infty$

3.3

- $\lim_{b \rightarrow \infty} [\ln x]_2^b = \lim_{b \rightarrow \infty} (\ln b - \ln 2)$; $\ln b \rightarrow \infty$, so it **diverges**