MAC2312: Calculus 2 - Section 3

Quiz 6: 7.8 Improper Integrals

June 9, 2015

1. Determine whether $\int_3^\infty \frac{1}{(x-2)^{3/2}}\,dx$ is convergent or divergent.

A. convergent

B. divergent

$$\begin{aligned}\int_3^\infty \frac{1}{(x-2)^{3/2}}\,dx &= \lim_{t\to\infty}\int_3^t \frac{1}{(x-2)^{3/2}}\,dx \\ &= \lim_{t\to\infty}\left[-\frac{2}{\sqrt{x-2}}\right]_{x=3}^{t} \\ &= \lim_{t\to\infty} -\left[\frac{2}{\sqrt{t-2}}-2\right] \\ &= -\left[\lim_{t\to\infty}\frac{2}{\sqrt{t-2}}-2\right] = 2\end{aligned}$$