

Quiz 8

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. (5 marks) §3.7 #21 Find the limit.

$$\begin{aligned} & \lim_{x \rightarrow 0^+} \sqrt{x} \ln x \quad \text{l.f. } 0 \cdot -\infty \\ & = \lim_{x \rightarrow 0^+} \frac{\ln x}{\frac{1}{\sqrt{x}}} \quad \text{l.f. } \frac{-\infty}{\infty} \\ & = \lim_{x \rightarrow 0^+} \frac{\frac{1}{x}}{\frac{-1}{2x^{3/2}}} \quad \text{by } \hat{H} \\ & = \lim_{x \rightarrow 0^+} \frac{-2x^{3/2}}{x} \\ & = \lim_{x \rightarrow 0^+} -2x^{1/2} \\ & = 0 \end{aligned}$$

Question 2. (5 marks) §3.7 #33 Find the limit.

$$\begin{aligned} y & = \lim_{x \rightarrow 0} (1-2x)^{\frac{1}{x}} \quad \text{l.f. } 1^\infty \\ \ln y & = \ln \lim_{x \rightarrow 0} (1-2x)^{\frac{1}{x}} \\ \ln y & = \lim_{x \rightarrow 0} \ln (1-2x)^{\frac{1}{x}} \\ \ln y & = \lim_{x \rightarrow 0} \frac{1}{x} \ln (1-2x) \\ \ln y & = \lim_{x \rightarrow 0} \frac{\ln (1-2x)}{x} \quad \text{l.f. } \frac{0}{0} \\ \ln y & = \lim_{x \rightarrow 0} \frac{\frac{1}{1-2x} \cdot -2}{1} \quad \text{by } \hat{H} \\ \ln y & = \lim_{x \rightarrow 0} \frac{-2}{1-2x} \\ \ln y & = -2 \\ e^{\ln y} & = e^{-2} \\ y & = e^{-2} \end{aligned}$$

Question 3. (5 marks) Evaluate the integral.

$$\int_{\sqrt[3]{5\pi/6}}^{\sqrt[3]{3\pi/4}} x^2 \sec(\pi - x^3) \tan(\pi - x^3) dx$$

see test #2.