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Quiz 4

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)* §5.5 #32 Evaluate the indefinite integral.

$$\int \frac{\sin x}{1+\cos^2 x}\, dx = \int \frac{1}{1+u^2}\, -du$$

$u = \cos x$

$du = -\sin x\, dx$

$-du = \sin x\, dx$

$$= -\int \frac{1}{1+u^2}\, du$$

$$= -\arctan u + C$$

$$= -\arctan(\cos x) + C$$

Question 2. *(5 marks)* §5.5 #49 Evaluate the definite integral.

$$\int_e^{e^4} \frac{dx}{x\sqrt{\ln x}} = \int_1^4 \frac{1}{\sqrt{u}}\, du$$

$u = \ln x$

$du = \frac{1}{x}\, dx$

$u(e^4) = \ln e^4 = 4$

$u(e) = \ln e = 1$

$$= \int_1^4 u^{-1/2}\, du = \left[2\sqrt{u} \right]_1^4$$

$$= \left[2\sqrt{4} - 2\sqrt{1} \right]$$

$$= 2\cdot 2 - 2$$

$$= 2$$