

## 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) Evaluate the indefinite integral:

$$\int \frac{43}{3x^2 + 18x + 33} dx = \int \frac{43}{3[(x+3)^2 + 2]} dx$$

$$= \frac{43}{3} \int \frac{1}{(x+3)^2 + 2} dx \quad \begin{array}{l} u = x+3 \\ du = dx \end{array}$$

$$= \frac{43}{3} \int \frac{1}{u^2 + 2} du$$

$$= \frac{43}{3} \frac{1}{\sqrt{2}} \arctan \frac{u}{\sqrt{2}} + C$$

$$= \frac{43}{3\sqrt{2}} \arctan \left( \frac{x+3}{\sqrt{2}} \right) + C$$

$$\begin{aligned} & 3x^2 + 18x + 33 \\ = & 3(x^2 + 6x + 11) \\ = & 3(x^2 + 6x + 9 - 9 + 11) \\ = & 3((x+3)^2 + 2) \end{aligned}$$

**Question 2.** (5 marks) Evaluate the indefinite integral:

$$\int \frac{1}{e^{\tan z} \cos^2 z} dz$$

see test #1