

## Quiz 10

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. (3 marks) §25.2 #23 Integrate.

$$\begin{aligned} & \int (1 + 12x^2)^2 dx \\ &= \int 1 + 24x^2 + 144x^4 dx \\ &= x + \frac{24x^3}{3} + \frac{144x^5}{5} + C \end{aligned}$$

Question 2. (3 marks) §25.4 #27 Evaluate the given definite integral.

$$\begin{aligned} \int_0^2 2x(9-2x^2)^2 dx &= \int_0^2 2x(9 - 36x^2 + 4x^4) dx \\ &= \int_0^2 162x - 72x^3 + 8x^5 dx \\ &= \left[ 162 \frac{x^2}{2} - 72 \frac{x^4}{4} + 8 \frac{x^6}{6} \right]_0^2 \\ &= 162 \frac{(2)^2}{2} - 72 \frac{(2)^4}{4} + 8 \frac{(2)^6}{6} = \frac{364}{3} \end{aligned}$$

Question 3. (4 marks) §25.5 #9 Approximate the value of the integral by use of the trapezoidal rule, using the given value of  $n$ . Round to 3 significant digits.

$$\begin{aligned} \int_0^5 \sqrt{25-x^2} dx \quad n=5 & \approx \frac{\Delta x}{2} [f(x_0) + 2f(x_1) + 2f(x_2) + 2f(x_3) + f(x_4)] \\ \Delta x = \frac{b-a}{n} = \frac{5-0}{5} = 1 & = \frac{1}{2} [\sqrt{25-0^2} + 2\sqrt{25-1^2} + 2\sqrt{25-2^2} + 2\sqrt{25-3^2} \\ x_i = a + i\Delta x = i & \quad + 2\sqrt{25-4^2} + \sqrt{25-5^2}] \\ x_0 = 0 & \\ x_1 = 1 & \\ x_2 = 2 & \\ x_3 = 3 & \\ x_4 = 4 & \\ x_5 = 5 & \end{aligned}$$

$$\hat{=} 19.0$$