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Quiz 9

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)* §27.6 #37 Find the slope of a line tangent to the curve of $y = e^{-x/2}\cos 4x$ for $x = 0.625$.

$$y' = \left(\frac{-1}{2}\right)e^{-x/2}\cos 4x + e^{\left(\frac{-x}{2}\right)}(-\sin 4x)4 = -\frac{1}{2}e^{-x/2}\cos 4x - 4e^{-x/2}\sin 4x$$

$$m_{tan} = y'(0.625)$$
$$= -\frac{1}{2}e^{\frac{-0.625}{2}}\cos(4(0.625)) - 4e^{\frac{-0.625}{2}}\sin 4(0.625)$$
$$= -1.458$$

Question 2. *(2 marks)* §25.1 #11 Determine the value of a that makes $F(x)$ an antiderivative of $f(x)$.

$f(x) = \frac{1}{x^2}$, $F(x) = \frac{a}{x}$

$$F(x) = \int f(x)dx = \int \frac{1}{x^2}dx = \frac{-1}{x} + C \qquad \therefore\ a = -1$$

Question 3. *(3 marks)* §25.1 #11 Find the antiderivative of the given functions.

$f(x) = \frac{-2}{(2x+1)^2}$

$$F(x) = \int f(x)dx = \int \frac{-2}{(2x+1)^2}dx = \frac{1}{(2x+1)} + C$$

$$\frac{d}{dx}\left[\frac{1}{(2x+1)} + C\right] = \frac{d}{dx}\left[(2x+1)^{-1} + C\right] = -(2x+1)^{-2}(2)$$
$$= \frac{-2}{(2x+1)^2}$$