

Show sufficient work to justify all answers.

1. (a) Find the derivative of $y = 4t^2 + \frac{13}{\sqrt{t}} - \frac{2}{t^2}$.

$$y' = \text{_____} [4]$$

- (b) Find $\frac{dy}{dx}$ if $y = 2^x$.

$$\frac{dy}{dx} = \text{_____} [4]$$

- (c) If $g(x) = x^2 \cdot e^x$, find $g'(x)$.

$$g'(x) = \text{_____} [4]$$

2. (a) If $f(x) = 2x^2 + x$, find $f'(2)$.

$$f'(2) = \underline{\hspace{10em}} [4]$$

(b) Find the equation of the tangent line to $f(x)$ at $x = 2$.

The equation of the tangent line is $\underline{\hspace{10em}}$ [4]