Practice worksheet | Vector calculus

Differentiating and integrating components

Name: _____ Date: _____

6 questions | 12 marks

1. Differentiate $(t^4, \ln t)$ for $t > 0$. [2 marks]

2. Find the second derivative of $(t^3, 2t^2, \cos t)$. [2 marks]

3. Integrate $(3t^2, 2t, 1)$ with initial position $(0, 1, -1)$ at zero. [2 marks]

4. Evaluate $\int_0^2 (t, 2t, 3)\, dt$. [2 marks]

5. Given $\mathbf{v} = (e^t, \cos t)$ and $\mathbf{r}(0) = (2, 0)$, find position. [2 marks]

6. Evaluate $\int_0^{\frac{\pi}{2}} (\cos t, \sin t)\, dt$. [2 marks]