

49) [i] $1 + 3x^2$ ✓

[ii] Chain Rule or Product Rule |

$2 \sin x \cos x$ |

[iii] Quotient Rule |

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

[iv] chain rule (1)

$2x \sin(x^2)$

write out diff wrt x

b)

$$y \frac{d}{dx}(x+1) + (x+1) \frac{dy}{dx} - 2 \frac{dy}{dx} = \sec^2 x \quad (1)$$

$$y + (x+1-2y) \frac{dy}{dx} = \sec^2 x \quad (1)$$

$$\frac{dy}{dx} = \frac{\sec^2 x - y}{x+1-2y} \quad (1)$$

c) $\frac{dx}{dt} = 2t$ $\frac{dy}{dt} = e^t$ (1)

$$\frac{dx}{dx} = \frac{dy}{dt} \cdot \frac{dt}{dx} = \frac{e^t}{2t} \quad (1)$$

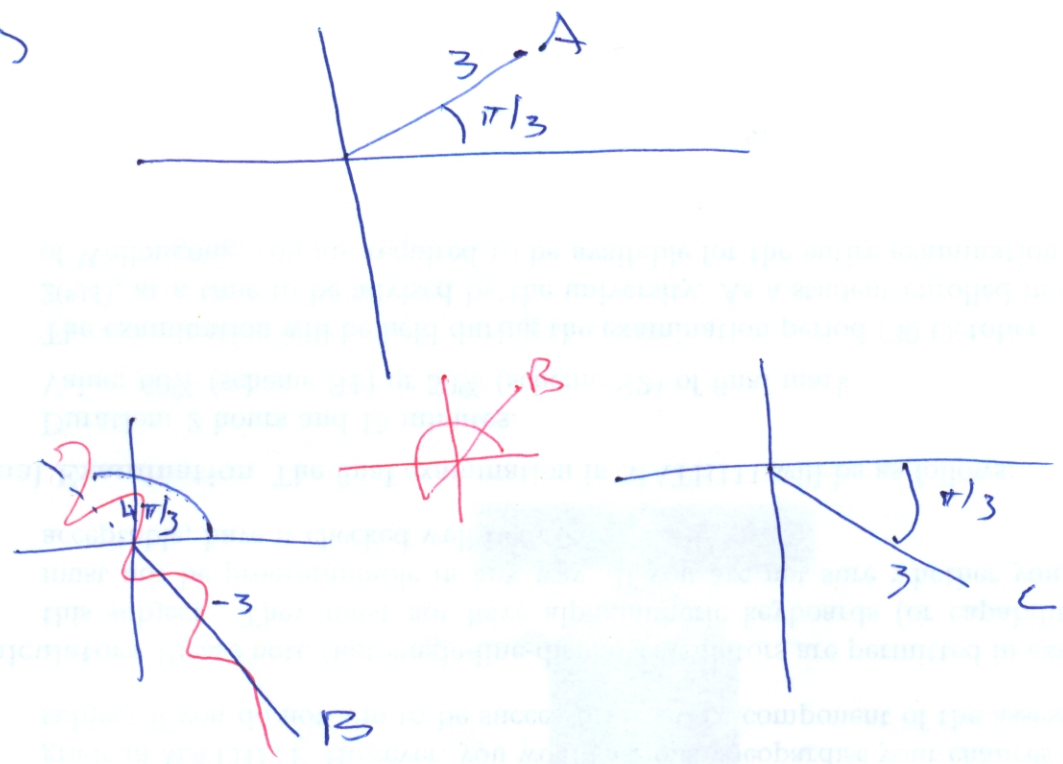
$$\frac{d^2y}{dx^2} = \frac{d}{dx} \left(\frac{e^t}{2t} \right) \quad (1)$$

$$= \frac{d}{dt} \left(\frac{e^t}{2t} \right) \cdot \frac{dt}{dx}$$

$$= \frac{2te^t - 2e^t}{(2t)^3} = \frac{2e^t(t-1)}{8t^3} \quad (1)$$

d) li)

1/2 each



lii)

$$r(3\cos\theta + 2\sin\theta) = 6$$

$$\frac{r(3r\cos\theta + 2r\sin\theta)}{r} = 6$$

$$3x + 2y = 6$$

1 1/2