

Maths : Functions , Assessed work (3), Solutions

1) $\frac{d^2x}{dy^2} = \frac{d}{dy} \frac{dx}{dy} = \frac{dx}{dy} \frac{d}{dx} y^{-1} = \frac{1}{y'} - y'^{-2} y''$
 chain rule $= -\frac{y''}{y'^3}$ c 4

2) multiple chain rule!

write $f(g) = \sin^2 g$ with $g = \cos x$

$$\frac{df}{dx} = \frac{dg}{dx} \frac{df}{dg} = -\sin x \cdot 2 \sin g \cos g$$

$$= -\sin x \sin 2g$$

$$= -\sin x \sin(2 \cos x)$$
 a

3) by LH (since "0/0")

$$= \lim_{x \rightarrow -1} \frac{\pi \cos \pi x}{1} = -\pi$$
 c

2