Ficha de trabalho 5

1) a)

$$r(t) = (3\operatorname{sen} t^2,\ 3\cos t^2) \quad , t \in [0, \sqrt{2\pi}]$$

$$r'(t) = (6t\cos t^2,\ -6t\operatorname{sen} t^2)$$

$$\| r'(t) \| = \sqrt{(6t\cos t^2)^2 + (-6t\operatorname{sen} t^2)^2}$$

$$\| r'(t) \| = (6t\cos t^2) + (6t\operatorname{sen} t^2)$$

$$\| r'(t) \| = 6t \quad \text{c.q.m}$$

b) $\int_0^{\sqrt{\pi}} 6t\,dt = 3t^2$ $\qquad \int_0^{\sqrt{2\pi}} 3(\sqrt{2\pi}^2)$

$3(\sqrt{\pi})^2 - 3\times 0^2$ $\qquad = 6\pi$

$= 3\pi$

c) $v(s) = \left(3\operatorname{sen}\left(\frac{s}{3}\right),\ 3\cos\left(\frac{s}{3}\right)\right)$

$$v'(s) = \left(\frac{1}{3}\times 3\cos\left(\frac{s}{3}\right),\ -\frac{1}{3}\times 3\operatorname{sen}\left(\frac{s}{3}\right)\right)$$

$$v'(s) = \left(\cos\left(\frac{s}{3}\right),\ -\operatorname{sen}\left(\frac{s}{3}\right)\right)$$

$$\| v'(s) \| = \sqrt{\left(\cos\left(\frac{s}{3}\right)\right)^2 + \left(-\operatorname{sen}\left(\frac{s}{3}\right)\right)^2}$$

$$\| v'(s) \| = 1$$

c.q.m