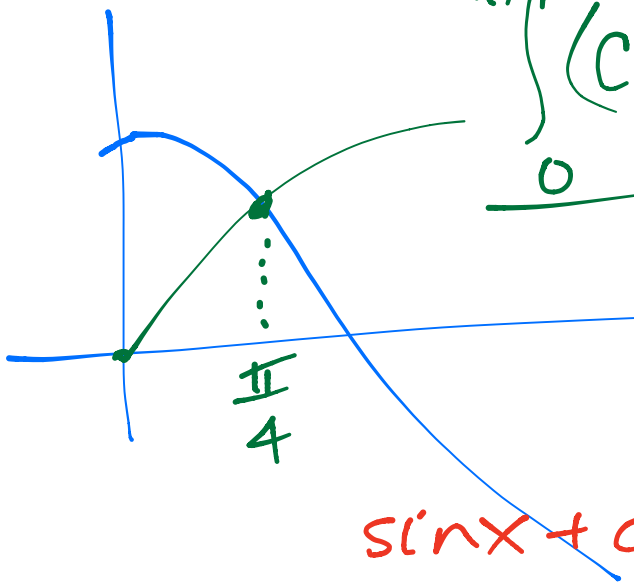


$$\frac{\int_0^{\pi/4} (\cos x - \sin x)\,dx}{\pi/4 - 0}$$

$$\frac{\sin x + \cos x \Big|_0^{\pi/4}}{\pi/4}$$

$$\frac{4}{\pi}\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} - (0+1)\right)$$

$$\frac{4}{\pi}(\sqrt{2}-1) \quad C$$

(12) $a(t)=t^2$ $\quad v(0)=-72$

$$\int a(t)\,dt = v(t)$$

$$\int t^2\,dt = \frac{t^3}{3}+C$$

$$v(t)=\frac{t^3}{3}+C$$

$$v(0)=72 \rightarrow C=-72$$

$$v(t)=\frac{t^3}{3}-72$$

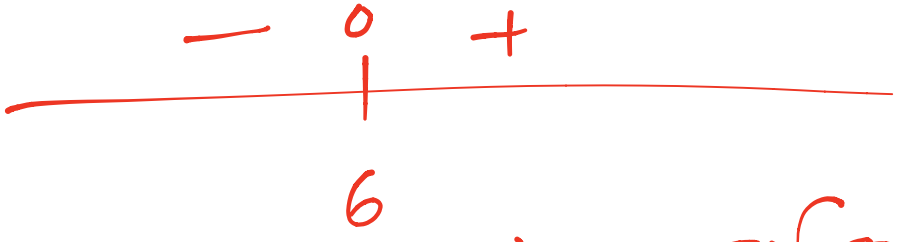
$$\frac{t^3}{3}-72=0$$

$$\frac{t^3}{3}=72$$

$$t^3=216$$

$t=6$

$t^3/3-72=v(t)$



Since $v(t)$ goes from $-$ to $+$ at $t=6$, the particle changes dir. @ $t=6$. B

(16) $\int_1^5 \sqrt{x-1}\,dx = \frac{1}{4}\int_1^5 (x-1)^{1/2}\,dx$

$\frac{1}{5-1}$

$= \frac{1}{4}\cdot\frac{2(x-1)^{3/2}}{3}\Big|_1^5$

$= \frac{1}{2}\cdot\frac{4^{3/2}}{3} - 0$

$= \frac{1}{2}\cdot\frac{8}{3}$ $\frac{4}{3}$ C.

$4^{3/2} = (4^3)^{1/2}$

OR $(4^{1/2})^3$

$49^{3/2}$

$(7^2)^{3/2}$

7^3

343

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