The length of a longest interval in which the function $3 \sin x - 4 \sin^3 x$ is increasing, is *(2002S)*

(a) $\dfrac{\pi}{3}$ 　　 (b) $\dfrac{\pi}{2}$ 　　 (c) $\dfrac{3\pi}{2}$ 　　 (d) π

SOLUTION

(a) $3 \sin x - 4 \sin^3 x = \sin 3x$ which increases for

$$3x \in \left(-\frac{\pi}{2}, \frac{\pi}{2} \right) \Rightarrow x \in \left(-\frac{\pi}{6}, \frac{\pi}{6} \right) \text{ whose length is } \frac{\pi}{3}.$$