50. Which of the following functions is decreasing on $\left(0, \dfrac{\pi}{2}\right)$?

(a) $\sin^2 x$ (b) $\tan x$ (c) $\cos x$ (d) $\cos 3x$

Sol. (c) $f_1(x) = \sin^2 x$, increases from '0' to '1' in $\left(0, \dfrac{\pi}{2}\right)$

$f_2(x) = \tan x$ is increasing function in each quadrant.

$f_3(x) = \cos x$, decreases from '1' to '0' in $\left(0, \dfrac{\pi}{2}\right)$

$f_4(x) = \cos 3x$, decreases if $3x \in \left(0, \dfrac{\pi}{2}\right)$ or $x \in \left(0, \dfrac{\pi}{6}\right)$