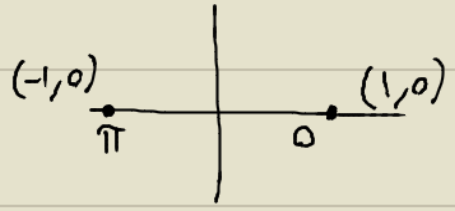
9. $f(x) = \cos\left(\frac{\pi x}{4}\right) \quad [0, 8]$

① $f'(x) = -\sin\left(\frac{\pi x}{4}\right) \cdot \frac{d}{dx}\left(\frac{\pi x}{4}\right)$

$= -\sin\left(\frac{\pi x}{4}\right) \cdot \frac{\pi}{4}$

$= -\frac{\pi}{4}\sin\left(\frac{\pi x}{4}\right)$



② $-\frac{\pi}{4}\sin\left(\frac{\pi x}{4}\right) = 0$

$\sin\left(\frac{\pi x}{4}\right) = 0$

$\sin \underline{0} = 0$ $\quad \sin \underline{\pi} = 0$ $\quad \sin \underline{0 + 2\pi} = 0$ $\quad \sin \underline{\pi + 2\pi} = 0$

$\sin \underline{2\pi} = 0$ $\quad \sin \underline{3\pi} = 0$

$\frac{\pi x}{4} = 0$ $\quad \frac{\pi x}{4} = \pi$ $\quad \frac{\pi x}{4} = 2\pi$ $\quad \frac{\pi x}{4} = 3\pi$

$\pi x = 0$ $\quad \pi x = 4\pi$ $\quad \pi x = 8\pi$ $\quad \pi x = 12\pi$

$x = 0$ $\quad x = \frac{4\pi}{\pi}$ $\quad \frac{\pi x}{\pi} = \frac{8\pi}{\pi}$ $\quad \frac{\pi x}{\pi} = \frac{12\pi}{\pi}$

$x = 4$ $\quad x = 8$ $\quad \cancel{x = 12}$

③

$x = 0$

$f(0) = \cos\left(\frac{\pi \cdot 0}{4}\right)$

$= \cos 0$

$= 1$

$x = 4$

$f(4) = \cos\left(\frac{\pi \cdot 4}{4}\right)$

$= \cos \pi$

$= -1$

ABS MIN $(4, -1)$

$x = 8$

$f(8) = \cos\left(\frac{\pi \cdot 8}{4}\right)$

$= \cos 2\pi$

$= 1$

ABS · $(0,1)$
max $(8,1)$