6. $f(x) = \cos^2\left(\frac{1}{2}x - 1\right)$

① $f(x) = \left[\cos\left(\frac{1}{2}x - 1\right)\right]^2$

$f'(x) = 2\left[\cos\left(\frac{1}{2}x - 1\right)\right]^1 \cdot \frac{d}{dx}\left(\frac{1}{2}x - 1\right)$

$= 2\cos\left(\frac{1}{2}x - 1\right) \cdot \frac{1}{2}$

$= \boxed{\cos\left(\frac{1}{2}x - 1\right)}$

② $\cos\left(\frac{1}{2}x - 1\right) = 0$

$\cos\frac{\pi}{2} = 0$ $\quad$ $\cos\frac{3\pi}{2} = 0$ $\quad$ $\cos\frac{\pi}{2} + 2\pi = 0$ ✗ $\quad$ $\cos\frac{3\pi}{2} + 2\pi = 0$ ✗

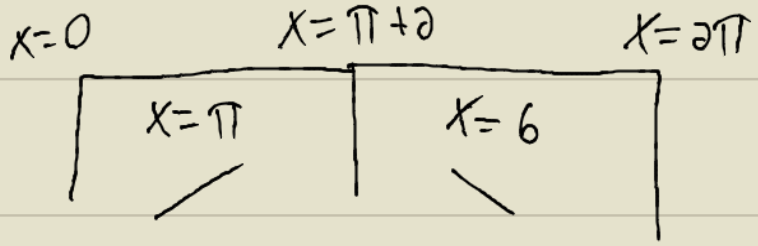
$\frac{1}{2}x - 1 = \frac{\pi}{2}$ $\quad$ $\frac{1}{2}x - 1 = \frac{3\pi}{2}$

$2\left(\frac{1}{2}x\right) + 2(-1) = 2\left(\frac{\pi}{2}\right)$ $\quad$ $2\left(\frac{1}{2}x\right) + 2(-1) = 2\left(\frac{3\pi}{2}\right)$

$x - 2 = \pi$ $\quad$ $x - 2 = 3\pi$

$x = \pi + 2$ $\quad$ $x = 3\pi + 2$

③



INC $(0, \pi + 2)$

DEC $(\pi + 2, 2\pi)$