$$A = \left[\frac{-40\cos\left(\frac{\pi t}{10}\right)}{\pi}\right] + \left[\frac{2\pi}{5} \cdot \pi t - 5\sin\frac{\left(\frac{\pi t}{5}\right)}{2\pi}\right]_0^{10}$$

$$A = \left[\left\{\frac{-40\cos\left(\frac{\pi(10)}{10}\right)}{\pi} + \frac{\pi(10)-5\sin\left(\frac{\pi 10}{5}\right)}{5}\right\}\right] - \left[\frac{40\cos\left(\frac{0}{10}\right)}{\pi} + \frac{\pi(10)-5\sin 0}{5}\right]$$

$$A = \left[\frac{40}{\pi} + 2\pi\right] - \left[\frac{-40}{\pi}\right]$$

$$\therefore \frac{40}{\pi} + 2\pi + \frac{40}{\pi}$$

$$A = \frac{80}{\pi} + \frac{2\pi}{\pi} - \frac{80+2\pi^2}{\pi}$$

$$A = \underline{31.74 \text{ square units}}$$

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① $A = \int_a^b y\,dx$

Between two curves

$A = \int_a^b y_1\,dx - \int_a^b y_2\,dx$

$A = \int_1^2 3e^{2x} - \int_1^2 3e^{-x}$

$A = 3\left[\frac{e^{2x}}{2}\right]_1^2 - 3\left[-e^{-x}\right]_1^2$

$A = 3\left[\frac{e^4}{2} - \frac{e^2}{2}\right] - 3\left[-e^{-2} - (-e^{-1})\right]$

$A = 70 - 8.14 - 3[-e^{-2} + e^{-1}]$

$A = 70 - 8.14 - 3[0.283]$

$A = 20.115 \text{ units}^2$

② $y = 2\sin\frac{\pi}{10}t \quad x = 2t + 2t - 2\cos\pi/10t$

$A = \int_a^b y\,dx \quad a = 0, \; b = 10$

$\frac{1}{2} \cdot dx \cdot 2x \cdot t \cdot \frac{1}{5}\sin\frac{\pi}{10}t + dt$

$A = \int_0^{10} 2\sin\frac{\pi}{10}t \cdot (2 \cdot t + \frac{1}{5}\sin\pi/10t]$

$A = \int_0^{10}\left[4\sin\frac{\pi}{10}t + (2 \cdot t + \frac{1}{5}\sin\left(\frac{\pi t}{10}\right)^2\right]$

$A = \int_0^{10} 4\sin\frac{\pi}{10}t + t + \int_0^{10}\frac{2\pi\sin\left(\frac{\pi t}{10}\right)^2}{5}$

$A = 4\int_0^{10}\sin\frac{\pi}{10}t + t + \frac{2\pi}{5}\int_0^{10}\sin\left(\frac{\pi t}{10}\right)^2$