

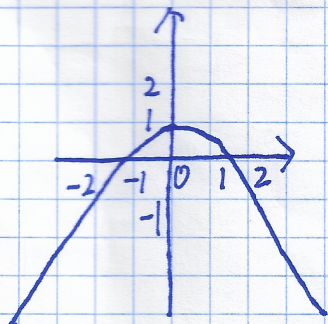
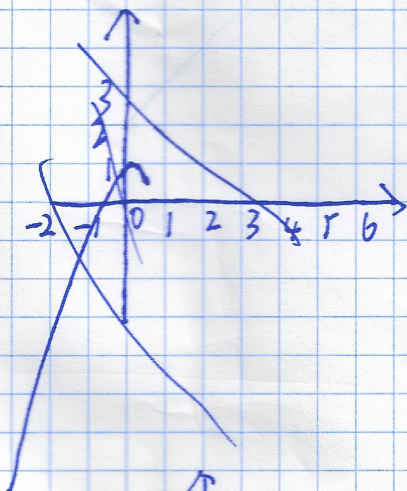
$$3. \quad x = A_1 \cos \omega t$$

$$y = -A_2 (2 \cos^2 \omega t - 1)$$

$$A_1 = 1 \text{ cm}, A_2 = 1 \text{ cm}$$

$$\begin{cases} x = 2 \cos \omega t \\ y = -2 \cos^2 \omega t + 1 \end{cases}$$

$$y = -\frac{x^2}{2} + 1$$



$$4. \quad x_1 = A \cos(\omega x + \varphi_1)$$

$$x_2 = A \cos(\omega x + \varphi_2)$$

$$x = x_1 + x_2$$

$$= A \cos(\omega t + \varphi_1) + A \cos(\omega t + \varphi_2)$$

$$= A \cos \omega t \cdot \cos \varphi_1 + A \cos \omega t \cdot \cos \varphi_2 - A \sin \omega t \cdot \sin \varphi_1 - A \sin \omega t \cdot \sin \varphi_2$$

$$= [A \cos \varphi_1 + A \cos \varphi_2] \cos \omega t - [A \sin \varphi_1 + A \sin \varphi_2] \sin \omega t$$

$$= [A \cos \varphi_1 + A \cos \varphi_2] \cos \omega t - [A \sin \varphi_1 + A \sin \varphi_2] \sin \omega t$$

$$= [A \cos \varphi_1 + A \cos \varphi_2] \cos \omega t - [A \sin \varphi_1 + A \sin \varphi_2] \sin \omega t$$

gna  $x$ :

$$A_x = \sqrt{[A \cos \varphi_1 + A \cos \varphi_2]^2 + [A \sin \varphi_1 + A \sin \varphi_2]^2}$$

$$= \sqrt{2A^2 + 2A^2 \cos(\varphi_2 - \varphi_1)}$$

$$\cos(\varphi_2 - \varphi_1) = \frac{1}{2}, \quad \varphi_2 - \varphi_1 = \frac{2}{3}\pi$$