

$$f\left(\frac{cx+y}{\omega}\right), \quad -2 \leq \frac{3x+y}{\omega} \leq 2 \Rightarrow -1 \leq \frac{3x+y}{\omega} \leq 2 \Rightarrow -1 \leq 3x \leq 1 \Rightarrow -\frac{1}{3} \leq x \leq \frac{1}{3}$$

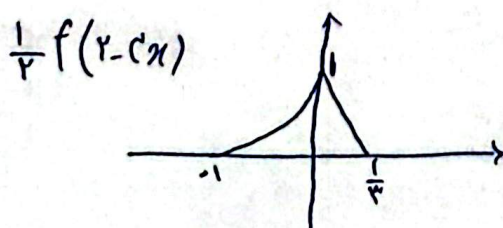
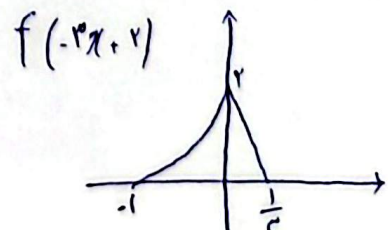
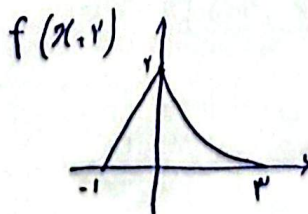
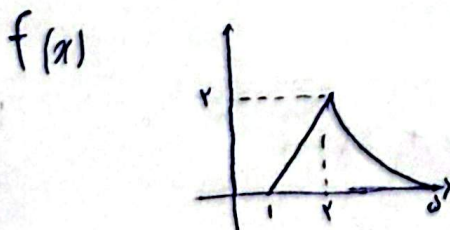
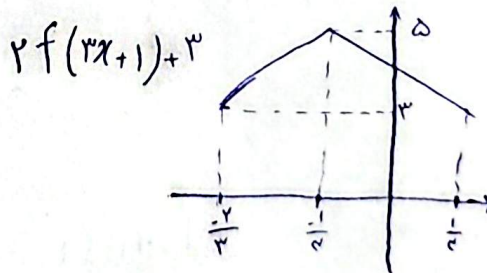
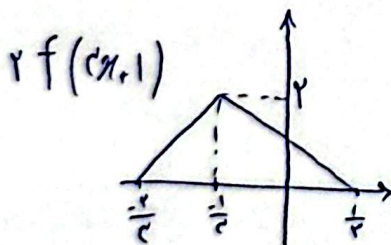
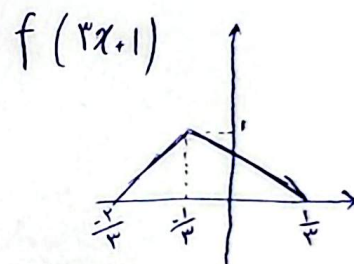
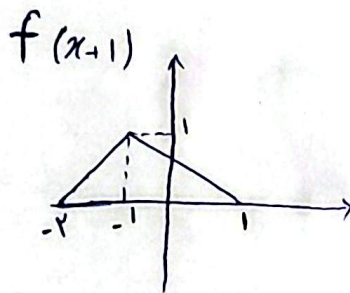
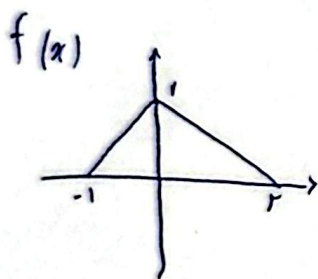
$$D_f = [-1, 1]$$

$$-2 \leq x \leq 2 \Rightarrow -4 \leq 3x \leq 4 \Rightarrow -1 \leq 3x-2 \leq 4 \Rightarrow D_f = [-1, 4]$$

$$-1 \leq x \leq 2 \Rightarrow -1 \leq 3x \leq 4 \Rightarrow -1 \leq 3x+1 \leq 5 \Rightarrow -1 \leq \frac{3x+1}{2} \leq 5 \Rightarrow x \in [-1, 5]$$

$$-1 \leq 2-x \leq 5 \Rightarrow -3 \leq -x \leq 3 \Rightarrow 3 \geq x \geq -3 \Rightarrow \frac{3}{\omega} \geq x \geq \frac{-3}{\omega}$$

$$D_{f(2-x)} = \left[\frac{-3}{\omega}, \frac{3}{\omega}\right]$$



$$y = \frac{1}{\omega} x^r + \frac{r}{\omega} x + 1 \rightarrow x_s, \frac{-r}{\frac{r}{\omega}} = \frac{r}{\omega} \quad y_s = \frac{1}{\omega} \left(\frac{r}{\omega}\right)^r + \frac{r}{\omega} \left(\frac{r}{\omega}\right) + 1 = \frac{r+1}{\omega}$$

$$\frac{r}{\omega} + \alpha = \varepsilon \Rightarrow \alpha = \frac{1-\varepsilon}{\omega}$$

$$\frac{r+1}{\omega} + \beta = r \Rightarrow \beta = \frac{r\omega - r - 1}{\omega}$$

$$y = \frac{1}{\omega} x^r + \frac{r}{\omega} x + 1 = \frac{r\omega - r - 1}{\omega} \Rightarrow -\frac{r\omega}{\omega} x^r + \frac{r}{\omega} x + \frac{1}{\omega} = \frac{r\omega - r - 1}{\omega} \Rightarrow r\omega x^r - r x - 1 = r\omega - r - 1$$

$$x_1 = -\frac{1}{\omega} \quad x_r = \frac{1}{\omega}$$

$$-\frac{1}{\omega} + \frac{1}{\omega} = \frac{0}{\omega} = -\varepsilon, \varepsilon$$

$$\frac{1}{\omega} + \frac{1}{\omega} = \frac{2}{\omega} = \varepsilon$$

$$r\alpha + r = 1 \Rightarrow \alpha = \frac{1-r}{r}$$

$$1 - r f(1) = \beta \Rightarrow 1 - r \cdot 1 = \beta \Rightarrow \beta = 1 - r$$

$$\alpha\beta = \frac{1}{r} \cdot \frac{1-r}{r} = \frac{1-r}{r^2}$$

$$D_{f(x-1)} = (a+1, \omega]$$

$$D_{f(x+1)} = [x, b-1)$$

$$D_{f(x-1)} \cap D_{f(x+1)} = (-r, \omega)$$

$$\Rightarrow a+1 = -r \Rightarrow a = -r-1$$

$$b-1 = \omega \Rightarrow b = \omega+1$$

$$a \cdot b = (-r-1)(\omega+1) = -r\omega - r - \omega - 1$$

$$-r \leq x \leq \omega \Rightarrow \frac{x}{r} \leq \frac{\omega}{r} \Rightarrow \frac{x}{r} + 1 \leq \frac{\omega}{r} + 1 \Rightarrow D_{f(x)} = [-\frac{\omega}{r}, \frac{\omega}{r} + 1] \Rightarrow D_{g_r} = [-\frac{\omega}{r}, \frac{\omega}{r} + 1]$$

$$R_{g_r} = R_{f(\frac{x}{r})} = R_f(x) \Rightarrow -1 \leq f(x) \leq r \Rightarrow -1 \leq r f(x) \leq r^2$$

$$0 \leq |r f(x) - c| \leq \omega \Rightarrow R_{g_r} = [0, \sqrt{\omega}]$$

$$g(x) = f(x-r) + 1 = \left| \frac{(x-r)+1}{r(x-r)+1} \right| = \left| \frac{x-1}{rx-r} \right| + 1$$

$$g(x) \neq x \begin{cases} x < 0 \\ g(x) > 0 \end{cases} \Rightarrow x < 0$$

$$g(x) = \frac{x-1}{rx-r} + 1 \Rightarrow g(x) = \frac{rx - \varepsilon}{rx - r} \Rightarrow g(x) + x = \frac{rx - \varepsilon}{rx - r} + x \Rightarrow g(x) + x = \frac{rx^2 - \varepsilon x - rx + r}{rx - r} = \frac{rx^2 - \varepsilon x - rx + r}{rx - r}$$

$$rx^2 - \varepsilon x - rx + r < 0 \Rightarrow x^2 - \varepsilon x - x + 1 < 0 \Rightarrow x^2 - (1+\varepsilon)x + 1 < 0 \Rightarrow \begin{cases} x > \sqrt{1+\varepsilon} \\ x < -\sqrt{1+\varepsilon} \end{cases} \Rightarrow x < -\sqrt{1+\varepsilon}$$