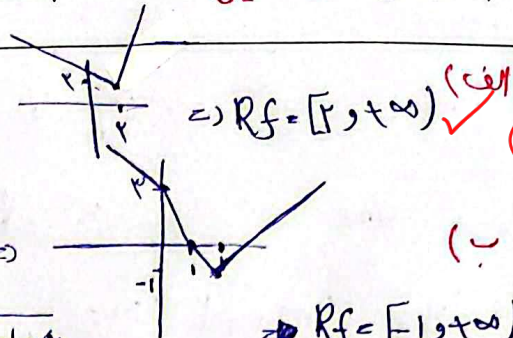


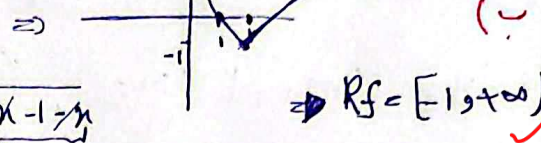
$$g = x + |2x - 4|$$

$$\frac{x - x + 4}{-x + 4} \quad \frac{x + 2x - 4}{3x - 4} \Rightarrow$$



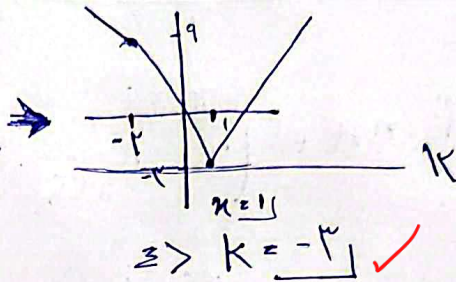
$$g = |x - 2| + |x - 1| - |x|$$

$$\Rightarrow \frac{x - x + 2}{-x + 2} \quad \frac{x - x + 1}{-x + 1} \quad \frac{x - x + 1}{-x + 1} \quad \frac{x - x + 1}{-x + 1}$$



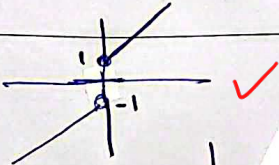
$$|3x - 3| - |x + 2| = k$$

$$\frac{3x - 3x + 3}{-3x + 3} \quad \frac{x + 2x + 2}{3x + 2} \quad \frac{3x - 3x + 3}{-3x + 3}$$



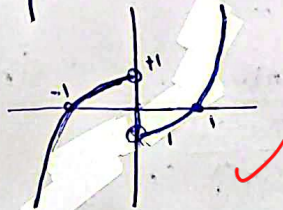
$$g = x + \frac{x}{|x|}$$

$$\frac{x - x + 1}{x - 1} \quad \frac{x + x + 1}{x + 1}$$



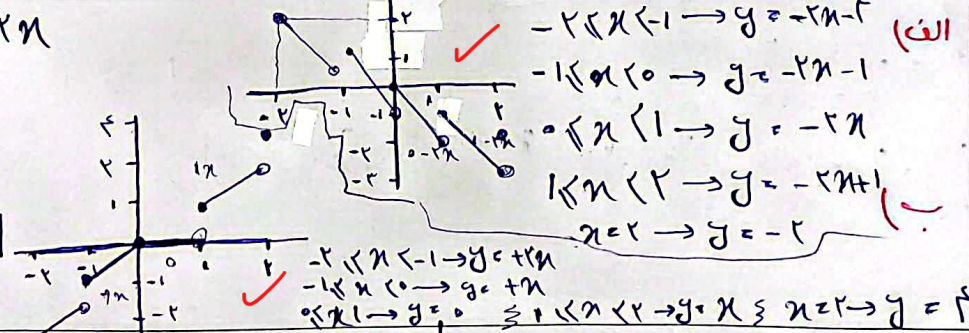
$$g = x|x| - \frac{x}{|x|}$$

$$\frac{-x^2 + 1}{-x^2 + 1} \quad \frac{x^2 - 1}{x^2 - 1}$$



$$g = [x] - 2x$$

$$g = [x]|x|$$

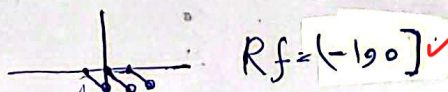


$$[3x] - [x] = 2 + [x]$$

$$3x - 4[x] = 3(x - [x])$$

$$x - 4[\frac{x}{4}] \div 0 = \frac{x}{4} - [\frac{x}{4}] \Rightarrow R_f = [0, 1) \times 0 \rightarrow [0, 1)$$

$$[2x] - 2x = [x] - x$$



$$-\sqrt{a^2+b^2} \leq a \sin x + b \cos x \leq \sqrt{a^2+b^2}$$

$$r \sin x + r \cos x \Rightarrow -\sqrt{r^2} \leq Rf \leq \sqrt{r^2} \Rightarrow Rf = [-\sqrt{r^2}, \sqrt{r^2}] \quad \checkmark \quad (الف) \quad (2)$$

$$r \sin x - r \cos x \Rightarrow -\sqrt{r^2} \leq Rf \leq \sqrt{r^2} \Rightarrow Rf = [-\sqrt{r^2}, \sqrt{r^2}] \quad \checkmark \quad (ب) \quad (2)$$

$$[r \sin x + 0 \cos x] \Rightarrow -\sqrt{r^2} \leq Rf \leq \sqrt{r^2} \Rightarrow Rf = \{x | -r(x \leq 0, x \in \mathbb{Z})\} \quad \checkmark \quad (ج) \quad (2)$$

$$\sqrt{\cos x - r \sin x} \Rightarrow -\sqrt{1} \leq Rf \leq \sqrt{0} \Rightarrow Rf = [0, \sqrt{0}] \quad \checkmark \quad (د) \quad (2)$$

$$y = \sin^2 x + r \sin x + r \quad \begin{cases} x_{\min} = -\frac{b}{2a} = -\frac{r}{2} \\ x=1 \rightarrow y=r \\ x=-1 \rightarrow y=r \end{cases} \quad y_{\min} = \frac{9}{f} - \frac{9}{f} + r = \frac{9-1+1}{f} = \frac{1}{f} \quad \checkmark \quad (هـ) \quad (2)$$

$$-y = r \sin^2 x + r \sin x + r \quad \begin{cases} x_{\min} = -\frac{b}{2a} = -\frac{r}{2} \\ x=1 \rightarrow y=r \\ x=-1 \rightarrow y=r \end{cases} \quad y_{\min} = \frac{9}{f} - \frac{9}{f} + \frac{1}{f} = \frac{1}{f} \quad \checkmark \quad (و) \quad (2)$$

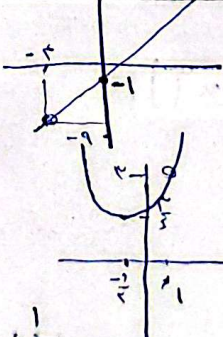
$$\sin^2 x + \cos^2 x + r \cos^2 x \Rightarrow Rf = [1, r] \quad \checkmark \quad (ز) \quad (2)$$

$$\frac{r \cos^2 x}{1 + \cos^2 x} = \frac{r \cos^2 x}{\sin^2 x + \cos^2 x} = r \sin^2 x \cos^2 x = \sin^2 x \cos^2 x \quad \checkmark \quad (ح) \quad (2)$$

$$r^{-k} \leq \sin^k x + \cos^k x \leq 1 \Rightarrow \frac{1}{f} \leq \sin^2 x + \cos^2 x \leq 1 \quad \checkmark \quad (ط) \quad (2)$$

$$\Rightarrow Rf = \left[\frac{1}{f}, 1\right] \quad \checkmark \quad (ي) \quad (2)$$

$$y = \frac{(x-1)(x+1)}{(x+1)}$$



$$Rf = \mathbb{R} - \{-1\} \quad \checkmark \quad (ك) \quad (2)$$

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

$$-\frac{b}{2a} = -\frac{1}{2} \quad y_{\min} = \frac{3}{4}$$

$$Rf = \left(\frac{3}{4}, +\infty\right) \quad \checkmark \quad (ل) \quad (2)$$