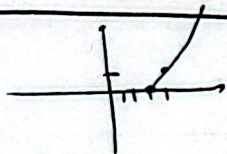






الف )



$$\sqrt{x^2-1} \rightarrow x = \sqrt{y+1} \rightarrow y-1 = x^2 \rightarrow y = x^2+1 = f^{-1}(x)$$

ب )  $\sqrt{x^2-1} \rightarrow x = (\sqrt{y+1})^2 + 1 - 1 \rightarrow (y+1)^2 = x+1$

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$$y-1 = \sqrt{x+1}$$

$$x = (y-1)^2 - 1$$

$$f^{-1}(x) = \sqrt{x+1} + 1$$

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

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

$$\xrightarrow{\text{رؤس}} y = x + \frac{1}{x} + \frac{1}{x} - \sqrt{x + \frac{1}{x}} \rightarrow f^{-1}(x) = x - \frac{1}{x} - \sqrt{x + \frac{1}{x}}$$

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

$$a=1 \quad b=\frac{1}{x} \quad c=-\frac{1}{x}$$

$$f(x_1) = f(x_2) \rightarrow \frac{x_1}{\sqrt{x_1^2-1}} = \frac{x_2}{\sqrt{x_2^2-1}} \rightarrow \frac{x_1^2}{x_1^2-1} = \frac{x_2^2}{x_2^2-1}$$

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$$\cancel{x_1^2} \cdot \cancel{x_2^2} = \cancel{x_2^2} \cdot \cancel{x_1^2} \rightarrow x_1^2 = x_2^2 \rightarrow x_1 = \pm x_2 \xrightarrow{\text{رؤس}} x_1 = x_2$$

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

$$y^2 = \frac{x^2}{x^2-1} \rightarrow y = \pm \sqrt{\frac{x^2}{x^2-1}}$$

$$f^{-1}(x) = \frac{x}{1+|x|}$$

$$D_{f^{-1}} = -\frac{1}{0} \rightarrow R_g = -\frac{1}{0}$$

$$\sqrt{x}-1 = -\frac{1}{x} \rightarrow \sqrt{x} = \frac{x-1}{x} \rightarrow x = \frac{1}{x-1}$$

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$$-\frac{1}{x} = D_f \rightarrow -\frac{1}{x} = R_{f^{-1}}$$

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

$$\frac{x}{1+|x|} = -\frac{1}{x} \rightarrow 2x = -1-|x| \rightarrow 2x = -1+x \rightarrow x = -\frac{1}{x}$$

$$y = \sqrt{x-1} \xrightarrow{f(x)} y = x^2+1$$

$$g(x) = f(x) + \sqrt{f(x)} = 11$$

$$g \rightarrow (x, 11)$$

$$g^{-1} \rightarrow (11, x)$$

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$$f(x) = 9$$

$$x^2+1 = 9 \rightarrow x^2 = 8 \rightarrow x = \pm 2\sqrt{2}$$