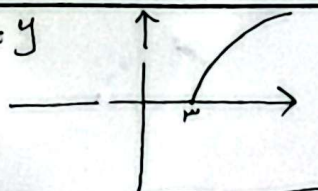
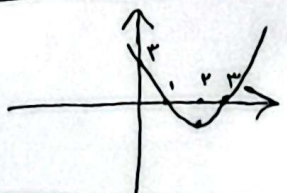


الف) $x^2 + 3 = y$		$\Rightarrow$ تابع یک به یک $\Rightarrow f^{-1}(x) = x^2 + 3$ $x = \sqrt{y-3} \Rightarrow x^2 = y-3 \Rightarrow y = x^2 + 3$	
ب) $x^2 - 4x + 3$		$y = (x-2)^2 - 1 \Rightarrow x-2 = \sqrt{y+1} \Rightarrow x = 2 + \sqrt{y+1}$ $\Rightarrow y = 2 + \sqrt{x+1}$ $\Rightarrow x \geq 2$ برای یک به یک است	۶
$y = x + \sqrt{x} \Rightarrow x = t^2 \Rightarrow y = t^2 + t \Rightarrow t^2 + t - y = 0 \Rightarrow t = \frac{-1 \pm \sqrt{1+4y}}{2}$ $\Rightarrow t = \sqrt{x}$ مثبت $\Rightarrow x = \left(\frac{-1 + \sqrt{1+4y}}{2}\right)^2 \Rightarrow f^{-1}(x) = \frac{1}{4}(1 - 2\sqrt{1+4x} + (1+4x))$ $\Rightarrow f^{-1}(x) = x + \frac{1}{4} - \frac{1}{4}(\sqrt{1+4x}) \Rightarrow a=1, b=\frac{1}{4}$ $c \Rightarrow \sqrt{x-c} = \frac{1}{4}\sqrt{1+4x} \Rightarrow x-c = \frac{1}{16}(1+4x) \Rightarrow 4x-4c = 1+4x \Rightarrow c = -\frac{1}{4}$ $a + 2b + 4c = 1 + 2(\frac{1}{4}) + 4(-\frac{1}{4}) = 1$			۷
$\frac{x_1}{\sqrt{x_1^2 - 2}} = \frac{x_2}{\sqrt{x_2^2 - 2}} \Rightarrow x_1^2 x_2^2 - 2x_1^2 = x_1^2 x_2^2 - 2x_2^2 \Rightarrow x_1^2 = x_2^2 = x_1 = \pm x_2$ یک می تواند دو علامت مختلف داشته باشد بنابراین نتیجه گیری اشتباه است (چون بدون ۲ رساندن ۱) $x_1 = x_2 = \frac{x}{\sqrt{x^2 - 2}} \Rightarrow y \sqrt{x^2 - 2} = x \Rightarrow y^2 x^2 - x^2 = 2y \Rightarrow x^2(y^2 - 1) = 2y \Rightarrow x^2 = \frac{2y}{y^2 - 1}$ $\Rightarrow x = \pm \sqrt{\frac{2y}{y^2 - 1}}$ علامت $y = \frac{\sqrt{2}x}{\sqrt{x^2 - 1}}$			
$\sqrt{x} - 1 = \frac{-2}{a} \Rightarrow \sqrt{x} = \frac{a-2}{a} \Rightarrow x = \frac{(a-2)^2}{a^2}$ $\frac{x}{1+ x } = \frac{-2}{a} \Rightarrow ax + 2 = -2 x $ ① $x > 0 \Rightarrow \sqrt{x} = 2 \Rightarrow x = 4$ ② $x < 0 \Rightarrow 3x = 2 \Rightarrow x = \frac{2}{3}$ $\sqrt{P}$ ① و ② $f(\frac{-2}{a}) + g^{-1}(\frac{-2}{a}) = \frac{-2}{3} + \frac{4}{15} = \frac{-50 + 27}{15} = \frac{-23}{15}$			۸
$\sqrt{f(x)} = t \Rightarrow t^2 + t = 12 \Rightarrow t^2 + t - 12 = 0 \Rightarrow (t+4)(t-3) = 0 \Rightarrow t = 3$ $\Rightarrow f(x) = 9 \Rightarrow \sqrt[3]{x-1} = f^{-1}(9) \Rightarrow \sqrt[3]{x-1} = 2$ $\Rightarrow g^{-1}(12) = 2$			۱۰