



1. Given
$$f(x) = 2x+1$$

(a) calculate the value of f(7)

$$f(7) = 2(7)+1 = 15 = 5$$

$$\frac{(b)}{(b)} f^{-1}(1)$$
= $(-1)^{-1}(1-1)^{-1$

xin teums of y

$$y = \frac{2x+1}{3}$$

$$y = 2x + 1$$

$$\Rightarrow 3y = 2x + 1$$

$$\Rightarrow 3y = 2x + 1$$

$$\Rightarrow 3y = 2x + 1$$

$$\Rightarrow (x) = 3x - 1$$

$$f'(x) = 3x - 1$$

$$\Rightarrow f'(x) = 3x - 1$$

$$f'(x) = 3x - 1$$

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$$\frac{3}{9(x)} = 3x - 1$$

$$9(x) = 2x + 4$$

(a)
$$f(g(x)) = 3(2x+4)-1 = 6x+12-1$$

= $6x+11$

$$f(g(2)) = 6(2)+1)$$

= 12+1)
= 21

(b)
$$ff(3) = 3(3x-1)-1 = 9x-4$$

$$f(f(3)) = 9(3)-4$$

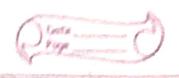
$$= 27-4$$

$$= 23$$

(c)
$$gf(\tau) = 2(3x-1)+4 = 6x-2+4$$

= $6x+2$

9



3. I(x), g(x) and h(x)

$$f(x) = x^2 - 3$$

 $g(x) = 2x + 1$
 $h(x) = x$

 $(a) - f(g(x)) = (2x+1)^2 - 3$ = $(4x^2+1+4x-3)$ = $(4x^2+4)x-2$

(b) gh(x) = 2(x) + 1= x + 1

(C) to-1(x).

x in terms of y

$$y = x \Rightarrow x = 2y = (i) = 0 = 0$$

 $\Rightarrow h^{-1}(x) = 2x$

Dy : (-0) 1- mil

-

$$t = f - \chi + \xi$$

$$+ \xi + \xi = \xi + \chi + \xi$$

$$\Rightarrow 4x = 24$$

$$\Rightarrow \chi = 24$$

$$\Rightarrow \chi = 6$$

$$4x-7=y$$

5.
$$f(x)=x^2+2$$
 and $g(x)=x+14$

given,
$$f(x) = g(x)$$

$$\Rightarrow \chi^2 + 2 = \chi + 14$$

$$\Rightarrow \frac{\chi^2 - \chi - 12 = 0}{\Rightarrow \chi^2 + 3\chi + 4\chi - 12 = 0}$$

$$\Rightarrow \chi(\chi+3) = 4(\chi+3) = 0$$

$$\Rightarrow (x + 4)(x + 3) = 0$$

$$x = 44 07 - 3$$

 $(4)^2 = (4)^2 + 2$ g(4) = 4 + 14 $f(\gamma) = 8 - 3x$ qf(x) = 80 $32 - 12\chi$ 32 - 12(3) 3(2) + 36 $4(8-3\chi)=80$ 32-12x = 80 $\Rightarrow -12\chi = 80 - 32$ -12 $\chi = 48$ x = 48



7.
$$f(x) = 3x + 1$$

8. $f(x) = x^{2} + 3x - 5$
 $f(2x - 1) = (2x - 1)^{2} + 3(2x - 1)$
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 $f(x) = kx + 3$
 $f(x) = kx + 3$
 $f(x) = kx + 3$
 $f(x) = 2kx + 6 - 4$
 $f(x) = 2kx + 2x - 4$
 $f(x) =$

10.
$$f(x) = x^{2} + 4$$

 $g(x) = x - 9$
 $f(g(x)) = (x - 9)^{2} + 4$

$$f(y(x)) = (x-9)^{2} + 4$$

$$= x^{2} + 81 - 18x + 4$$

$$= x^{2} - 18x + 85$$

$$g(f(\chi)) = 6(2+4)-9$$

= χ^2-5

$$f(g(x)) = g(f(x))$$

$$\Rightarrow \chi^2 - 18\chi + 85 = \chi^2 - 5$$

$$\Rightarrow -18x = -5 - 85$$

$$\Rightarrow$$
 $-18\pi = -90$

$$\Rightarrow \quad \chi = -90 = 5$$

$$-18$$

$$f(\gamma) = \chi^2 + 2\chi + 1$$

$$f(\chi + \chi) = (\chi + \chi)^2 + 2(\chi + \chi) + 1$$

$$= \chi^2 + 4 + 4\chi + 2\chi + 4 + 1$$

$$= \chi^2 + 6\chi + 9$$

$$f(x+2)-f(x)=x^2+6x+9-(x^2+2x+1)$$
= 6x+9-2x-1 = 4x+8