Chapter 8

Topic –Function

Answers to Assignment video 1 and 2 of Functions

Exercise – 11 Answers to Assignment video 1

1. a) Solution

Given $h : x \rightarrow x^2 + 1$

To find $h(2)$

$$h(2) = x^2 + 1$$
$$= 2^2 + 1$$
$$= 5$$

To find $h(-3)$

$$h(-3) = x^2 + 1$$
$$= (-3)^2 + 1$$
$$= 9 + 1$$
$$= 10$$

To find $h(o)$

$$h(0) = x^2 + 1$$
$$= 0^2 + 1$$
$$= 1$$

1 b). <u>Solution</u>

Given $g = x \rightarrow 10x + 1$

To find $g(2)$

$g(2) = 10x + 1$

$\quad = (10 \times 2) + 1$

$\quad = 21$

To find $g(-10)$

$g(-3) = 10x + 1$

$= 10 \times 10 + 1$

$= 101$

To find $g(-3)$

$g(-3) = 10x + 1$

$\quad = (10 \times -3) + 1$

$\quad = -30 + 1$

$\quad = -29$

7) $f : x \rightarrow 2x^2 + 1$

$x \rightarrow \boxed{\text{square}} \rightarrow \boxed{\times 2} \rightarrow \boxed{+1} \rightarrow 2x^2 + 1$

11) $f : x \rightarrow (7\text{-}3x)^2$
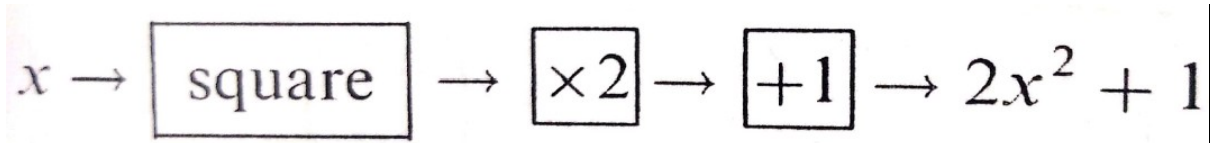
$x \rightarrow \boxed{\times 3} \rightarrow \boxed{\text{subtract from 7}} \rightarrow \boxed{\text{square}} \rightarrow (7 - 3x)^2$
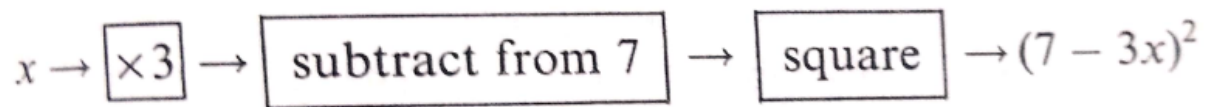
16) Given $f : x \rightarrow 1 + 2x$

a) To find $f(5)$

$f(5) = 1 - 2x$

$= 1 - (2 \times 5)$

$= 1 - 10$

$= -9$

To find $f(-5)$

$f(-5) = 1 - 2x$

$= 1 - (2 \times -5)$

$= 1 - (-10)$

$= 11$

To find $f(\frac{1}{4})$

$$f\left(\frac{1}{4}\right) = 1 - 2x$$

$$= 1 - 2 \times \frac{1}{4}$$

$$= 1 - \frac{1}{2}$$

$$= \frac{1}{2}$$

16 b) Given $g : x \rightarrow \dfrac{x^3}{10}$

To find $g(2)$

$$g2 = \frac{x^3}{10}$$

$$= \frac{2^3}{10}$$

$$= \frac{8}{10}$$

$$= 0.8$$

To find $g(-3)$

$$g(-3) = \frac{x^3}{10}$$

$$= \frac{-3^3}{10}$$

$$= -2.7$$

To find $g\left(\frac{1}{2}\right)$

$$g\left(\frac{1}{2}\right) = \frac{x^3}{10}$$

$$= \frac{\left(\frac{1}{2}\right)^3}{10}$$

$$= \frac{1}{8} \times \frac{1}{10}$$

$$= \frac{1}{80}$$

20 a) k: $x \rightarrow \dfrac{2x^2}{3}$

To find x**, Given k(**x**) = 6**

$2x^2 = 6 \times 3$

$x^2 = 9$

$x = 3$

20 b) m: $x \rightarrow 10 - x^2$

To find x**, Given m(**x**) = 1**

$10 - x^2 = 1$

$-x^2 = 1 - 10$

$-x^2 = -9$

$x^2 = 9$

$x = 3$

1 a) Solution

Given $f : x \rightarrow 4x$

$g : x \rightarrow x + 5$

So, $g(x) = x + 5$

$fg = 4(x + 5)$

In the form $x \rightarrow 4(x + 5)$

1 b) Given $g : x \rightarrow x + 5$

$f : x \rightarrow 4x$

So, $fx = 4x$

$gf = 4x + 5$

In the form $x \rightarrow 4x + 5$

7) Solution

7 a) lm(2)

Given m: $x \rightarrow 3x - 1$

So, m$(2) = 3x - 1$

$$= (3 \times 2) - 1$$

$$= 6 - 1$$

$$= 5$$

To find

lm$(2) = 2x + 1$ Given l: $x \rightarrow 2x + 1$

So, l$(5) = 2x + 1$

$$= (2 \times 5) + 1$$

$$= 10 + 1$$

$$= 11$$

So, lm(2) = 11

7b) nl(1)

Given l: $x \rightarrow 2x + 1$

$$l(1) = 2x + 1$$

$$= 2+1$$

$$= 3$$

To find

nl(1)$= x^2 = x + 1)$ **Given   n:** $x \rightarrow x^2$

So, n(3) $= x^2$

$$= 3^2$$

$$= 9$$

So, nl(1) = 9

11) Given $f : x \rightarrow 3(2x + 4)$

Solution

$3(2x + 4)$

Let $y = 3(2x + 4)$

$y = 6x + 12$

Make x the subject

$$-6x = 12 - y$$

$$+x = \frac{y - 12}{6}$$

so the inverse function is $\dfrac{x - 12}{6}$

Interchange x & y

$$x \to = \frac{x}{6} - \frac{12}{6}$$

$$x \to = \frac{x}{6} - 2$$

15) <u>Solution</u>

$$h : x \to \frac{1}{2}(4 + 5x) + 10$$

$$Let\ y = \frac{1}{2}(4 + 5x) + 10$$

$$y = 2 + \frac{5}{2}x + 10$$

$$y = \frac{5}{2}x + 12$$

Make x subject

$$\frac{5}{2}x = y - 12$$

$$5x = 2y - 24$$

$$x = \frac{2y - 24}{5}$$

so the inverse function is $\dfrac{2x - 24}{5}$

For an inverse function we inverse x and y

$$so, x \rightarrow \frac{2x - 24}{5}$$

21) Solution

$$g : x \rightarrow \left(\frac{\frac{x}{4} + 6}{5} \right) + 7$$

$$Let\ y = \left(\frac{\frac{x}{4} + 6}{5} \right) + 7$$

$$5(y - 7) = \frac{x}{4} + 6$$

$$5y - 35 - 6 = \frac{x}{4}$$

$$4(5y - 41) = x$$

$$20y - 164 = x$$

so the inverse function is $20x - 164$

For an inverse function we inverse x and y

$$x \rightarrow 20x - 164$$