

1. Given the function  $f(x) = \begin{cases} 2x+5 & \text{if } x \leq -3 \\ -(x+1)^2 + 5 & \text{if } -3 < x \leq 2 \\ -2 & \text{if } x > 2 \end{cases}$

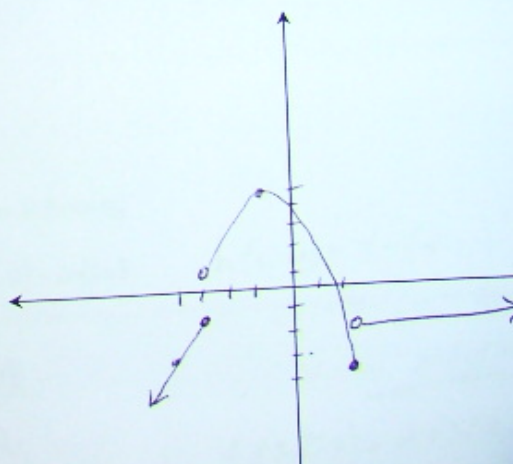
$f(-3) = -1$   
 $f(2) = -4$   
 $f(5) = -2$   
 $f(-2) = 4$

(a) Evaluate:  $f(-3) - 3f(2) + f[f(5)]$

$= -1 - 3(-4) + 4$   
 $= -1 + 12 + 4$   
 $= \boxed{15}$

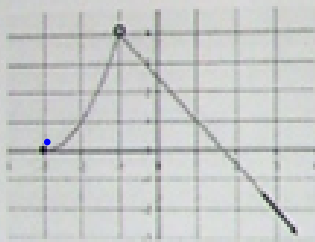
(b) Sketch the graph of  $f(x)$

x	y	x	y	Vertex
-3	-1	-3	1	$(-1, 5)$
-4	-3	2	-4	



2. State the domain and range for each of the following functions:

(a)



$D: \{x \mid x \geq -3, x \neq -1, x \leq 2\}$

$R: \{y \mid y < 4, y \in \mathbb{R}\}$

$(-\infty, 4)$

(b)  $f(x) = \sqrt{x^2 - x - 6}$

$D: x^2 - x - 6 \geq 0$   
 $(x-3)(x+2) = 0$   
 $x = 3, -2$

$\{x \mid x \geq 3 \text{ or } x \leq -2, x \in \mathbb{R}\}$

$\{y \mid y \geq 0\} \quad y \in \mathbb{R}$



$[3, \infty) \cup (-\infty, -2]$

$x \geq -3, x \neq -1, x \leq 2$

$[-3, -1) \cup (-1, 2]$

3. Given that  $f(x) = 2 + 3x$ ,  $h(x) = 4 - x^2$  and  $r(x) = 4x^2 - 1$  ....

(a) Evaluate each of the following:

[8]

(i)  $(f + h)(-1) =$

$$f(-1) + h(-1)$$
$$[2 + 3(-1)] + [4 - (-1)^2]$$

$$(-1) + (3)$$

$$= \underline{2}$$

(ii)  $(f \circ r \circ h)(1) =$

$$h(1) = 4 - (1)^2 = 3$$

$$r(3) = 4(3)^2 - 1 = 35$$

$$f(35) = 2 + 3(35)$$

$$= \underline{\underline{107}}$$

(c) Determine an expression in simplest form to represent the following:

[6]

$$g(w) = 3h(w-1) + f(3w^2-5) - 2r(5w)$$

$$\begin{aligned} g(w) &= 3(-w^2 + 2w + 3) + (9w^2 - 13) - 2(100w^2 - 1) \\ &= -3w^2 + 6w + 9 + 9w^2 - 13 - 200w^2 + 2 \\ &= \underline{-194w^2 + 6w - 2} \end{aligned}$$

$$\begin{aligned} h(w-1) &= 4 - (w-1)^2 \\ &= 4 - (w^2 - 2w + 1) \\ &= \underline{-w^2 + 2w + 3} \end{aligned}$$

$$\begin{aligned} f(3w^2-5) &= 2 + 3(3w^2-5) \\ &= 2 + 9w^2 - 15 \\ &= \underline{9w^2 - 13} \end{aligned}$$

$$\begin{aligned} r(5w) &= 4(5w)^2 - 1 \\ &= \underline{100w^2 - 1} \end{aligned}$$

Chapter Review from textbook...

Pages 56-57

#2, 3, 6, 8, 9, 10, 11, 14, 15, 16

Practice Test

Pages 58-59

All questions