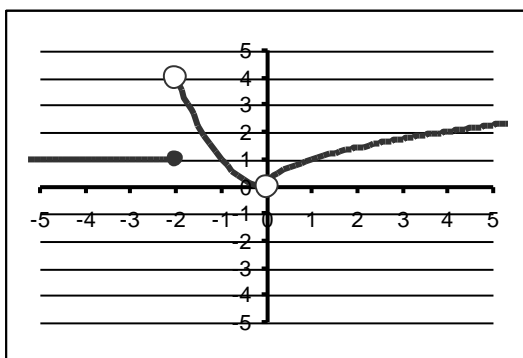


**Math 160 – Sections 2.1 and 2.2 - Limits**

**Problem (1) - You have been given the graph of  $y = f(x)$**



b) Complete the following table:

$a$	$f(a)$	$\lim_{x \rightarrow a^-} f(x)$	$\lim_{x \rightarrow a^+} f(x)$	$\lim_{x \rightarrow a} f(x)$	Is the function continuous at $x = a$	Explain why or why not
-2	1	1	4	DNE	NO	Lim DNE
-1	1	1	1	1	Yes	Lim = f(-1)
0	DNE	0	0	0	no	F(0) DNE
1	1	1	1	1	Yes	Lim = f(1)

b) Answer each of the following:

- 3) Domain  $x \neq 0$       2) Range  $Y > 0$       3) Write the formula(s) that define y  
 $Y = 1$  for  $x \leq -2$   
 $Y = x^2$  for  $-2 < x < 0$   
 $Y = \sqrt{x}$  for  $x > 0$

4) Intervals for which the function

Constant	Increasing	decreasing
$(-\infty, -2]$	$(0, \infty)$	$(-2, 0)$

- 5)  $F(-3) = 1$       6)  $F(-2) = 1$       7)  $F(-1) = 1$       8)  $F(0) = \text{DNE}$

- 9)  $F(1) = 1$       10)  $F(2) = \sqrt{2} = 1.414\dots$       11)  $F(3) = \sqrt{3} = 1.73\dots$

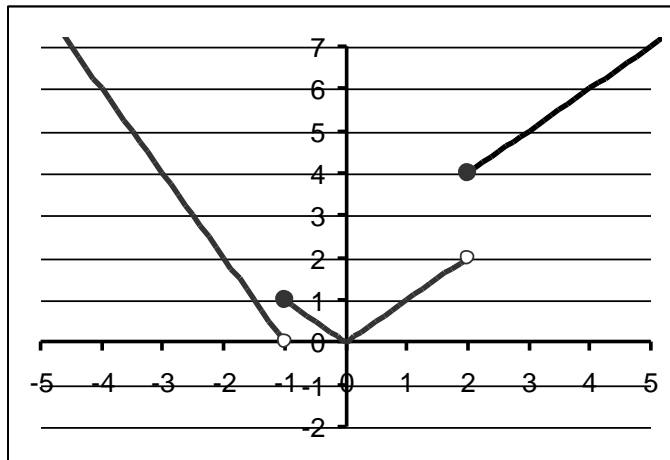
- 12) All x-intercepts - none      13) Y-intercept none

- 14) All x for which  $f(x) = 1$   
 $x \leq -2$  or  $x = -1$  or  $x = 1$       15) All x for which  $f(x) = 0$   
 none

- 16) All x for which  $f(x) > 0$   
 $x \neq 0$       17) All x for which  $f(x) \geq 4$   
 $x \geq 16$

- 18) All x for which the function intersects the line  $y = 3$   
 $X = -\sqrt{3} = -1.73$  AND  $X = 9$

**Problem (2) – For the following function:**



a) Complete the following table:

$a$	$f(a)$	$\lim_{x \rightarrow a^-} f(x)$	$\lim_{x \rightarrow a^+} f(x)$	$\lim_{x \rightarrow a} f(x)$	Is the function continuous at $x = a$	Explain why or why not
-2	2	2	2	2	Yes	Lim = f(-2)
-1	1	0	1	DNE	NO	LIM DNE
0	0	0	0	0	YES	LIM = F(0)
1	1	1	1	1	YES	LIM = F(1)
2	4	2	4	DNE	NO	LIM DNE

b) Make up a few questions similar to the ones for problem (1)