SOLUTIONS
1033
(3.2, 3.6, 3.7, 8.4
Practice Exercise
(VI) for Exam

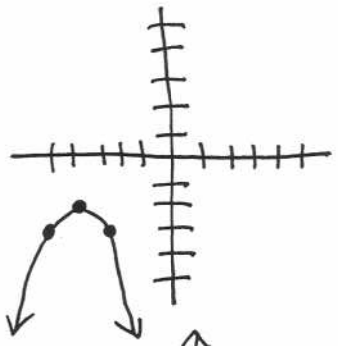
①

	shape	a	vertex	U/D	WNS
$y=2x^2+1$	↺	2	(0,1)	U	N
$y=-3(x-2)^3+1$	↘↗	−3	(2,1)	D	N
$y=\frac{1}{2}(x+4)^2-3$	↺	$\frac{1}{2}$	(−4,−3)	U	W
$y=\lvert x-3\rvert+2$	V	1	(3,2)	U	S
$y=x^3-8$	↗↘	1	(0,−8)	U	S

② (a) $y=-(x+4)^2-2$

↺ V = (−4,−2)
a = −1 down
standard

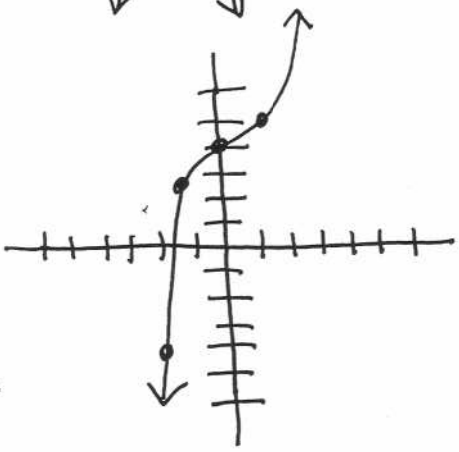
x	y
0	−18
−3	−3
−4	−2
−5	−3
−8	−18



(b) $y=x^3+4$

↗ "V" = (0,4)
a = 1 up
standard

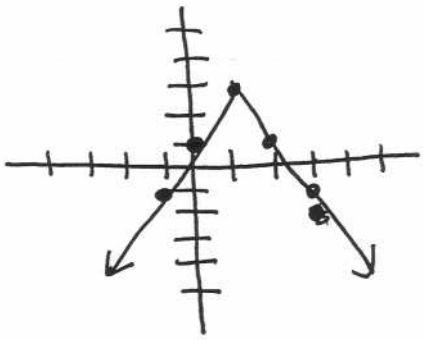
x	y
−2	−4
−1	3
0	4
1	5
2	12



(c) $y=-2\lvert x-1\rvert+3$

V (1,3)
a = −2 down
narrow

x	y
−1	−1
0	1
1	3
2	1
3	−1



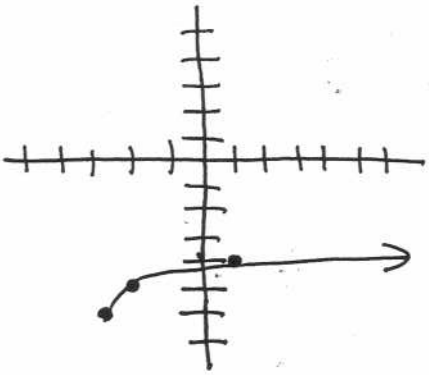
③

	"vertex"	U/D	L/R
$y = -2\sqrt{x-1} + 3$	(1, 3)	D	R
$y = \frac{1}{2}\sqrt{2-x} + 6$	(2, 6)	U	L
$y = -3\sqrt{6-x} + 1$	(6, 1)	D	L
$y = 4\sqrt{x+2} - 3$	(−2, −3)	U	R

④ ⓐ $y = \sqrt{x+3} - 6$

(−3, −6)
$a = 1$ up
standard
right

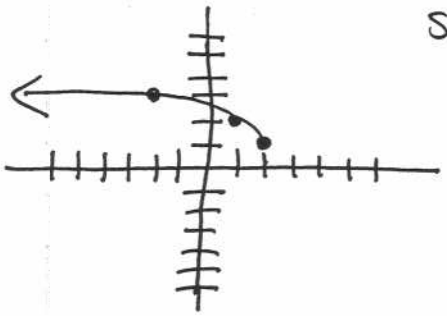
x	y
−4	$\sqrt{-1}$ ≠ DNE
−3	−6
−2	−5
1	−4



ⓑ $y = \sqrt{2-x} + 1$

(2, 1) $a = 1$
up, L,
standard

x	y
−2	3
1	2
2	1
3	$\sqrt{-1}$ DNE



⑤ a) yes
D: {1, 3, 5, 6, 7}
R: {2, 4, 6, 7}

b) no
D: {2}
R: {1, 2, 3, 4}

⑥ a) yes
b) no

⑦ a) yes
b) no
c) yes

⑧ a) D: $\mathbb{R}$
R: $\mathbb{R}$

b) D: $\mathbb{R}$
R: $y \geq 1$
$[1, \infty)$
up $(2, 1)$

c) D: $x \geq 1$
R: $y \geq 4$
$[4, \infty)$
up R $(1, 4)$ $[1, \infty)$

⑨ a) $f(2) = 2^2 + 3(2) - 2$
$= 4 + 6 - 2 = \boxed{8}$

b) $g(3) = 5(3) + 1 = \boxed{16}$

c) $f(4) - g(3) = 26 - 16 = \boxed{10}$
$f(4) = 4^2 + 3(4) - 2 = 16 + 12 - 2 = 26$
$g(3) = 5(3) + 1 = 16$

d) $f(z) = \boxed{z^2 + 3z - 2}$

⑩ a) $f(5)$ uses first part
$f(5) = 2(5) - 4 = \boxed{6}$

b) $f(3)$ also uses first part only
$f(3) = 2(3) - 4 = \boxed{2}$

Bonus $f(x) = 2x^2 - 3x + 4$
$f(x-3) = 2(x-3)^2 - 3(x-3) + 4$
$= 2(x^2 - 6x + 9) - 3x + 9 + 4$
$= 2x^2 - 12x + 18 - 3x + 9 + 4$
$\boxed{2x^2 - 15x + 31}$