

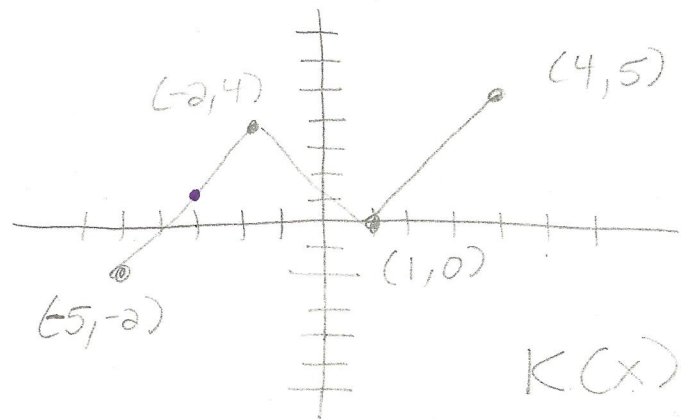
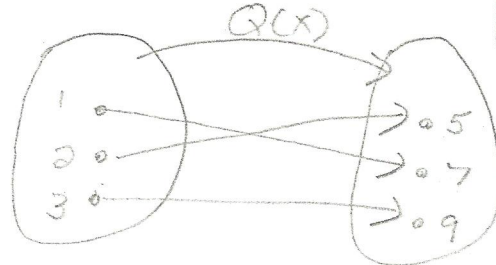
Consider the following functions:

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

$$g(x) = 2x - 7$$

$$h(x) = 15$$

| x | z(x) |
|----|------|
| 1 | 9 |
| 3 | 5 |
| 5 | 3 |
| 9 | 1 |
| 11 | 6 |



12 points
1 point each

Evaluate each of the following: (1 point each)

① $f(-2) = -4(-2)^2 + 3(-2) - 1 = -4(4) - 6 - 1 = -23$ ⑦ $Q(4) = \text{DNE}$

② $g(9) = 2(9) - 7 = 11$ ⑧ $K(1) = 0$ $(1, 0)$

③ $h(-3) = 15$ ⑨ Domain of K $[-5, 4]$

④ $z(3) = 5$ $(3, 5)$ ⑩ Range of K

⑤ $z(6) = \text{DNE}$ $[-2, 5]$

⑥ $Q(2) = 5$ $(2, 5)$ ⑪ $K(8) = \text{DNE}$

⑫ $K(-3) = +1$

13) Graph $f(x) = -2|x-3|+4$

8 points
graph 2pts
rest 1 point each

basic shape 

$(h,k) = (3,4)$

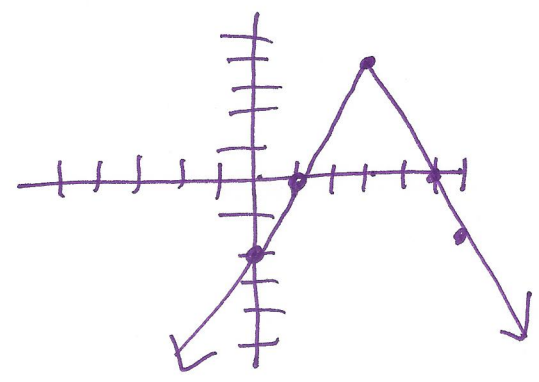
$a = -2$

final shape 

Domain $(-\infty, \infty)$

Range $(-\infty, 4]$

| x | y |
|---|----|
| 1 | 0 |
| 0 | -2 |
| 3 | 4 |
| 6 | -2 |
| 5 | 0 |



Graph

14) Graph $f(x) = (x+1)^3 - 2$

8 points
graph = 2pts
rest = 1pt each

basic shape 

$(h,k) = (-1, -2)$

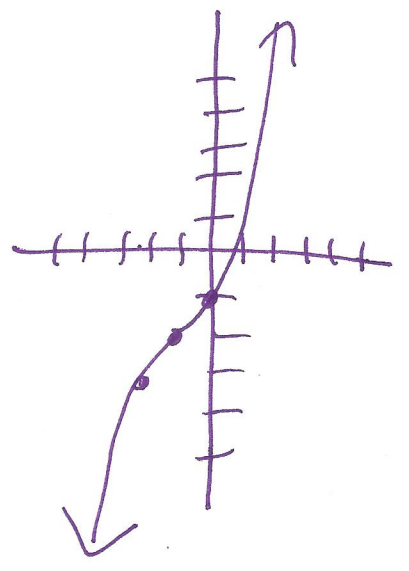
$a = 1$

final shape 

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

| x | y |
|----|----|
| -2 | -3 |
| -1 | -2 |
| 0 | -1 |



Graph

Sketch a graph of

(5) $f(x) = -\sqrt{x+1} - 2$

9 points
graph 2 pts
rest 1 pt each

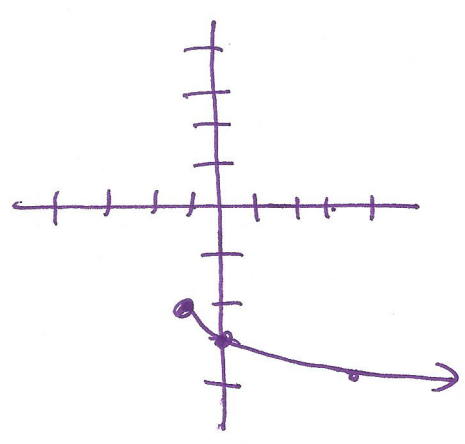
basic shape

$(h, k) = (-1, -2)$

$a = -1$

| x | y |
|----|----|
| -1 | -2 |
| 0 | -3 |
| 3 | -4 |

Graph



$+x$ or $-x$ R down right

final shape $(-1, -2)$

Domain $[-1, \infty)$

Range $(-\infty, -2]$
Sketch

9 points

graph 2 pts
rest 1 pt each

(16) $f(x) = 2\sqrt{3-x} + 1$

basic shape

$(h, k) = (3, 1)$

$a = 2$

Domain: $(-\infty, 3]$

Range: $[1, \infty)$

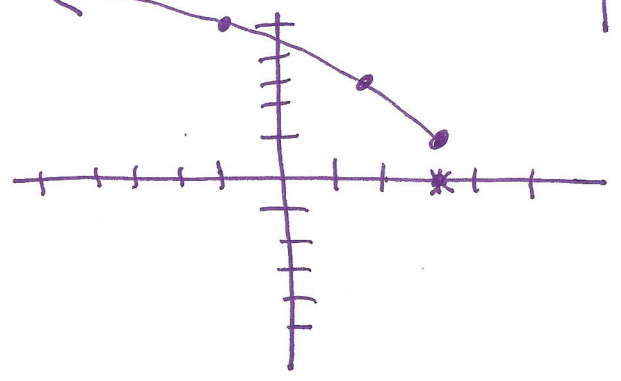
| x | y |
|----|---|
| -1 | 5 |
| 2 | 3 |
| 3 | 1 |

$-x$ or $+x$ opens L & up.

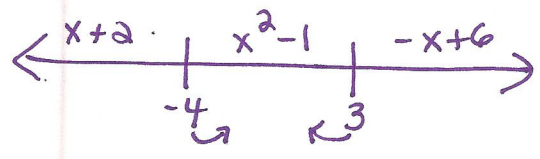
final shape

$(3, 1)$

Graph



(17) Let $f(x) = \begin{cases} x+2 & \text{if } x < -4 \\ x^2-1 & \text{if } -4 \leq x \leq 3 \\ -x+6 & \text{if } x > 3 \end{cases}$



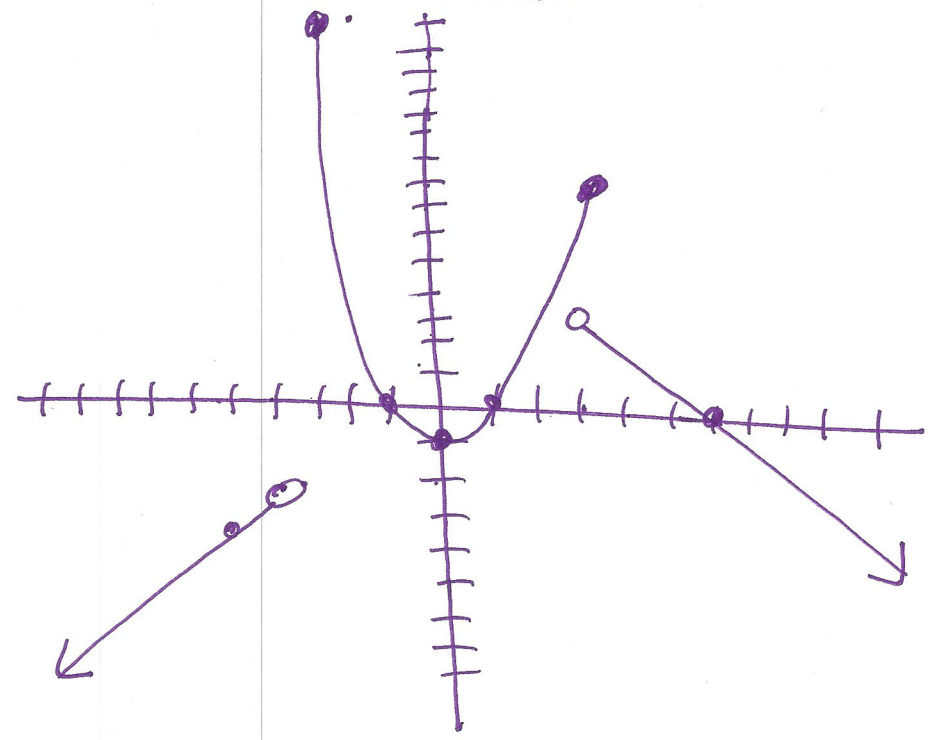
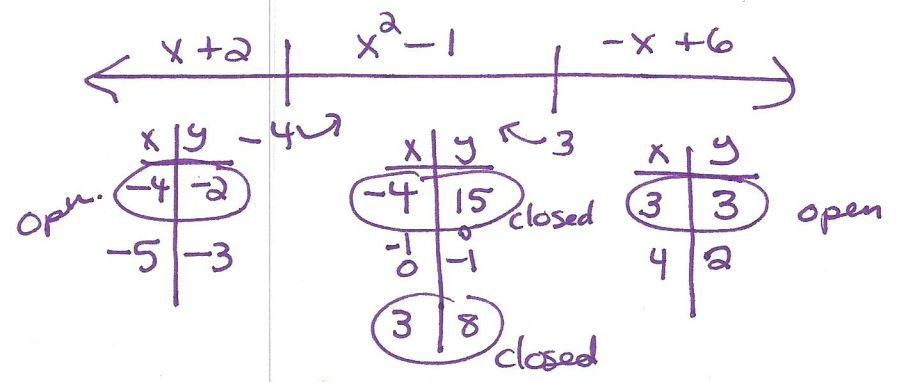
2pts each

a) find $f(1)$
 use x^2-1
 $(1)^2-1 = \boxed{0}$

b) find $f(3)$
 use x^2-1
 $3^2-1 = 9-1 = \boxed{8}$

(18) Sketch a graph of $f(x)$ from problem 17.

3pts



19) Let $f(x) = -2x^2 + 4x - 7$

1 point each
except h

9 pts

a) basic shape 

b) vertex

$$h = \frac{-b}{2a} = \frac{-4}{2(-2)} = 1$$

$$(1, -5)$$

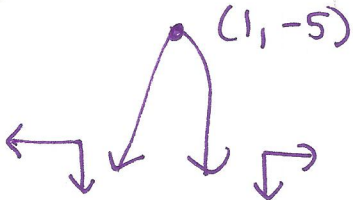
$$k = -2(1)^2 + 4(1) - 7 = -5$$

c) up or down

d) stretched compressed
or neutral

| x | y |
|---|----|
| 0 | -7 |
| 1 | -5 |
| 2 | -7 |

e) final shape



f) domain $(-\infty, \infty)$

g) range $(-\infty, -5]$

h) sketch a graph of $f(x)$

(2 pts)

