

Group Quiz 9 Solutions

① $f(x) = x^2$

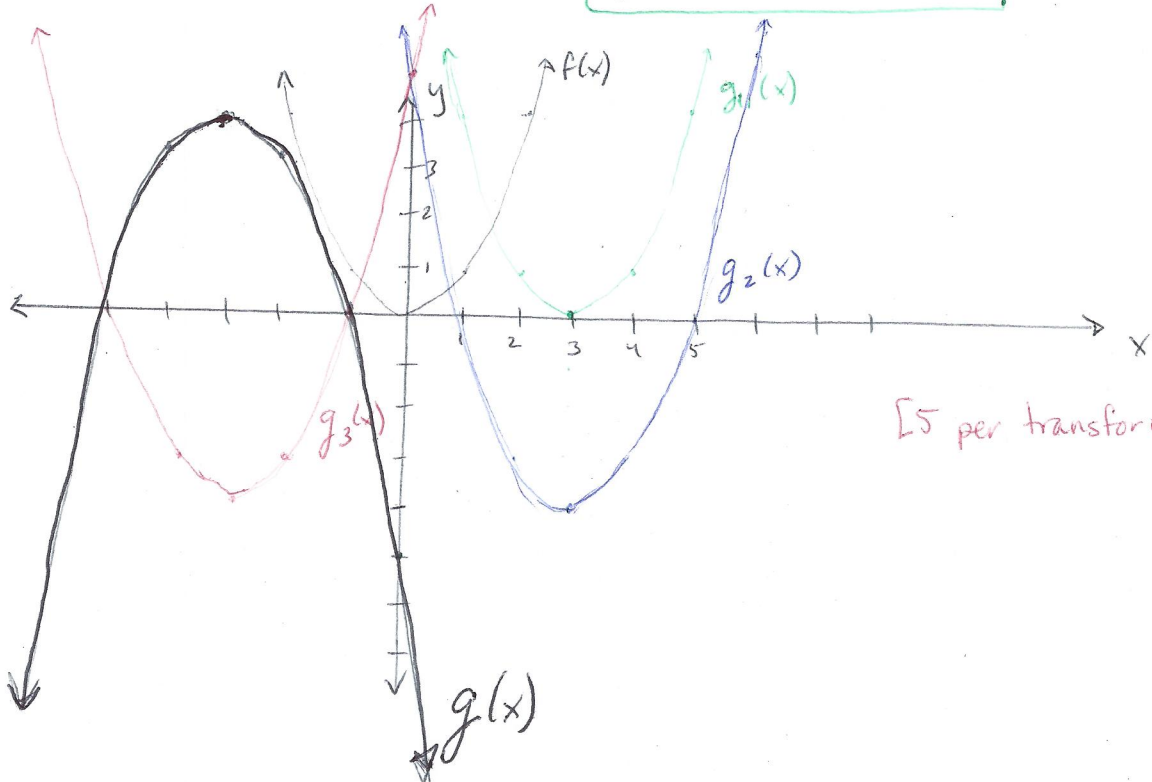
a) 1. right 3 $g_1(x) = f(x-3) = (x-3)^2$ [5]

2. down 4 $g_2(x) = g_1(x) - 4 = (x-3)^2 - 4$ [5]

3. reflect y-axis $g_3(x) = g_2(-x) = (-x-3)^2 - 4$ [5]

4. reflect x-axis $g(x) = -g_3(x) = -[(-x-3)^2 - 4]$

$$g(x) = -(x-3)^2 + 4$$
 [5]



① c) 1. reflect x-axis

$$g_1(x) = -f(x) = -x^2$$

(30 pt)

2. right 3

$$g_2(x) = g_1(x-3) = -(x-3)^2$$

3. down 4

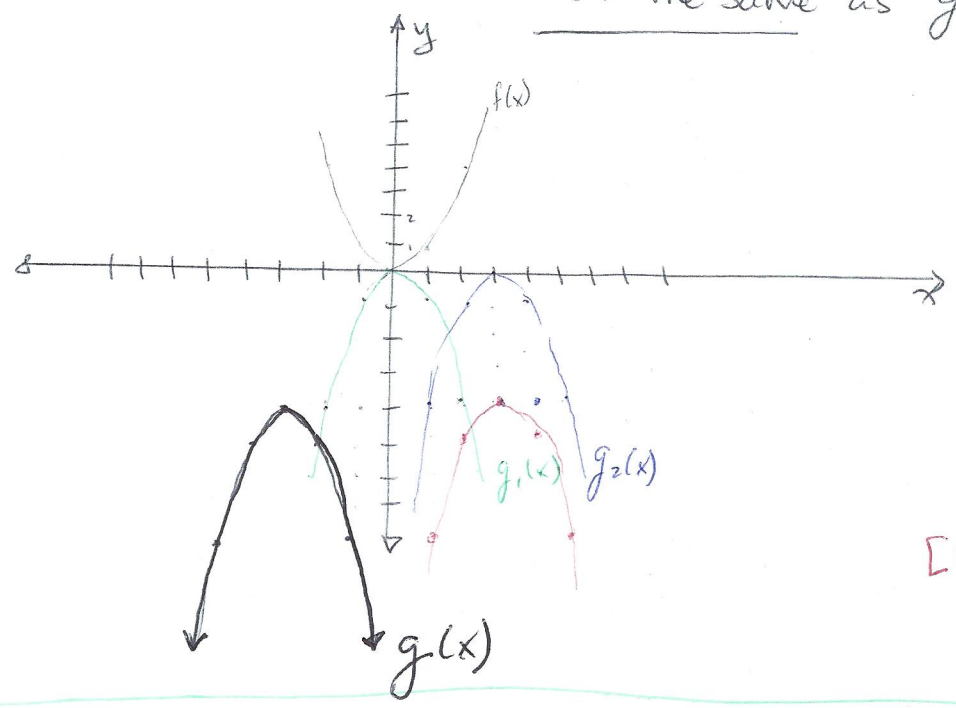
$$g_3(x) = g_2(x) - 4 = -(x-3)^2 - 4$$

4. y-axis

$$g(x) = g_3(-x) = -(-x-3)^2 - 4$$

[12]

Not the same as $g(x)$ from part (a)



[12]

The order in which we apply the transformations \neq reflections matters

[6]

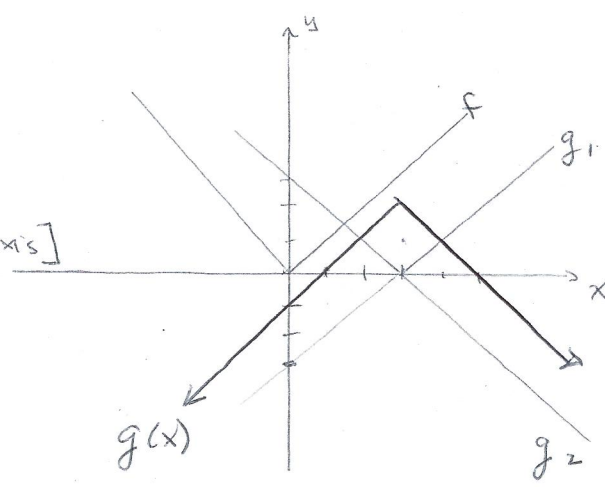
② a) $g(x) = 2 - |x-3|$
 (10 pt)

let $f(x) = |x|$

$g_1(x) = |x-3| = f(x-3)$ [right 3]

$g_2(x) = -|x-3| = -g_1(x)$ [reflect x-axis]

$g_3(x) = 2 - |x-3| = g_2(x) + 2$ [up 2]



check some points to be sure: (3, 2) ✓

(0, -1) ✓

(5, 0) ✓

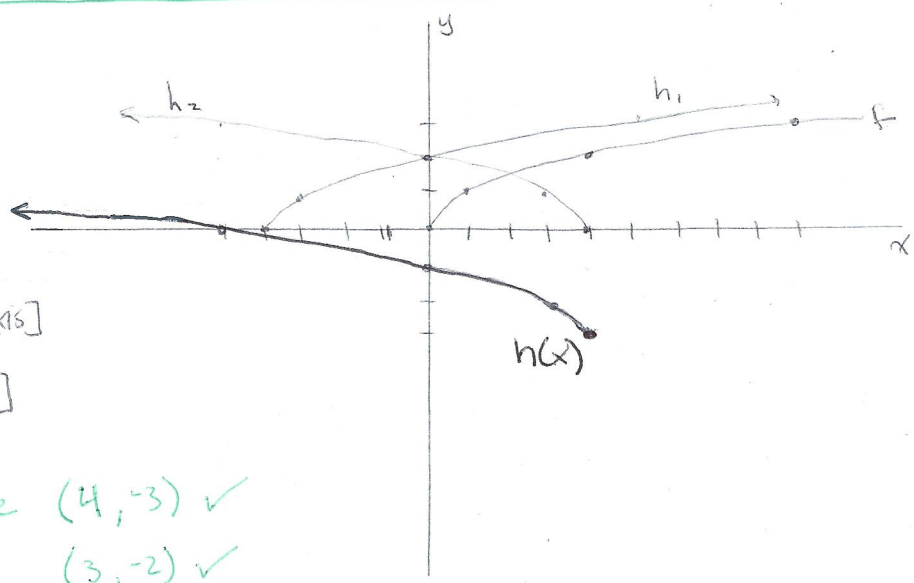
b) $h(x) = \sqrt{-x+4} - 3$
 (10 pt)

let $f(x) = \sqrt{x}$

$h_1(x) = \sqrt{x+4} = f(x-(-4))$ [left 4]

$h_2(x) = \sqrt{-x+4} = h_1(-x)$ [reflect y-axis]

$h_3(x) = \sqrt{-x+4} - 3 = h_2(x) - 3$ [down 3]



check some points to be sure (4, -3) ✓

(3, -2) ✓

(0, -1) ✓

(-5, 0) ✓

② c) $k(x) = -(x+2)^3$

(10 pts)

let $f(x) = x^3$

$k_1(x) = (x+2)^3 = f(x - (-2))$ [left 2]

$k_2(x) = -(x+2)^3 = -k_1(x)$ [reflect x-axis]

check some points

$(-2, 0) \checkmark$

$(-1, -1) \checkmark$

$(0, -8) \checkmark$

$(-3, 1) \checkmark$

$(-4, 8) \checkmark$

