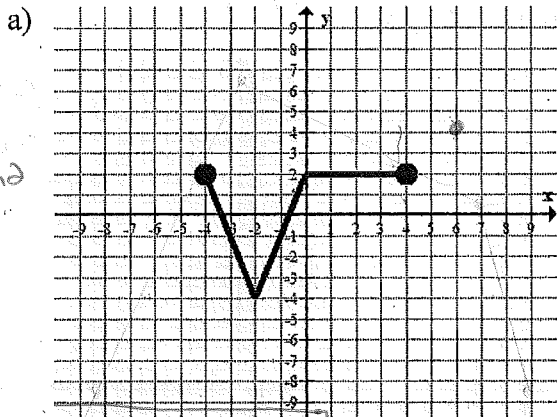
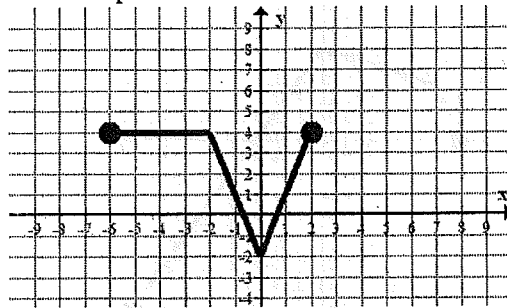


1.6 Combined Transformations Worksheet

Name: _____

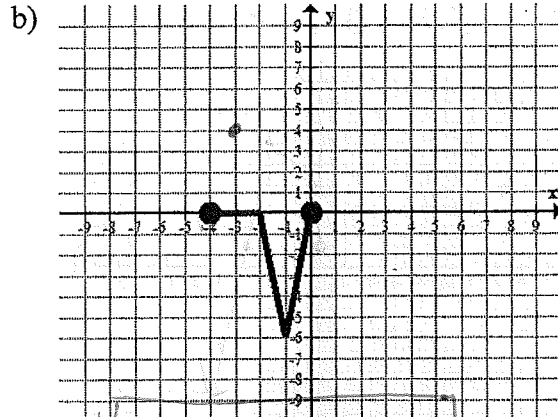
KEY

1. Given $y = f(x)$ below, write the equation of the two transformed graphs in the form $y = af(b(x-h)) + k$



C -
R - y-axis
T - left 2, down 2

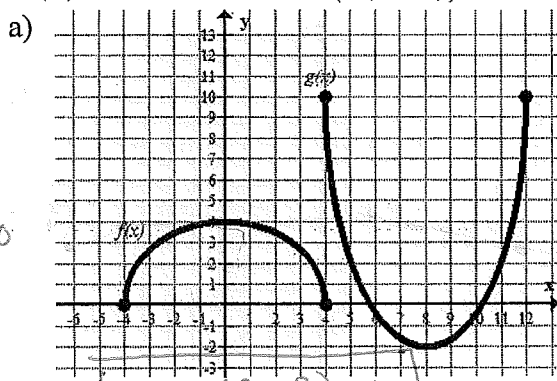
$y = f(-(x+2)) - 2$



C - invert
R - left
T - left 1, down 4

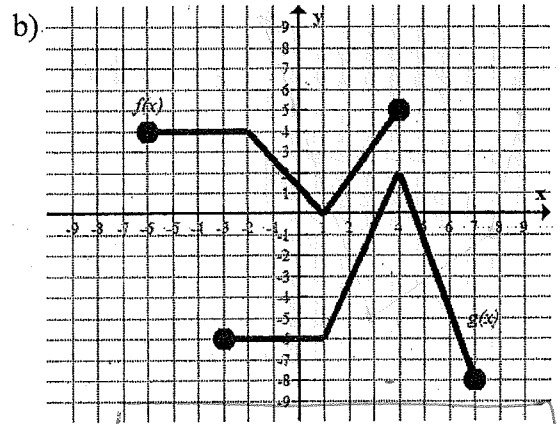
$y = f(2(x+1)) - 4$

2. The graph of $g(x)$ represents a transformation of the graph of $f(x)$. Determine the equation of $g(x)$ in the form $y = af(b(x-h)) + k$.



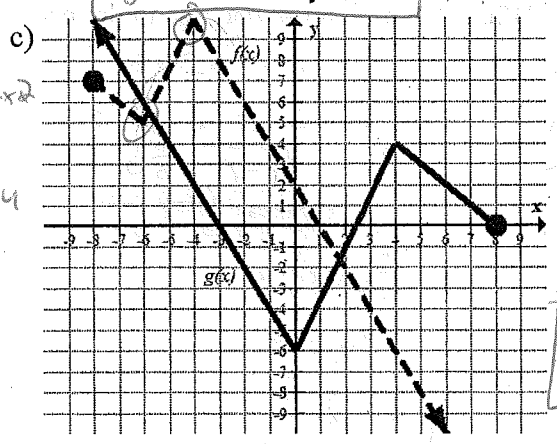
C - $3x+3$
R - x-axis
T - right 8, up 10

$y = 3f(x-8) + 10$



C - vert x 2
R - x-axis
T - up 2, right 3

$y = 2f(x-3) + 2$



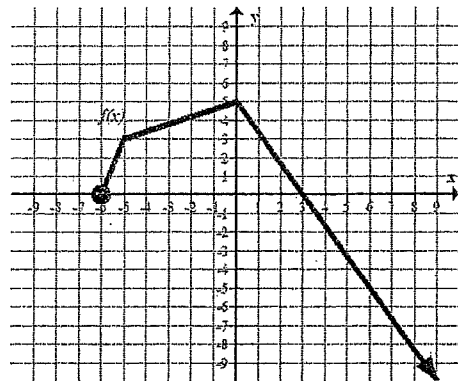
C - Vert x 2
R - x+y axis
T - left 8, up 14

$(-6, 5) \rightarrow (12, 10) \rightarrow (4, 4)$
 $(-4, 10) \rightarrow (8, 20) \rightarrow (0, -6)$

$y = 2f(-\frac{1}{2}(x+8)) + 14$

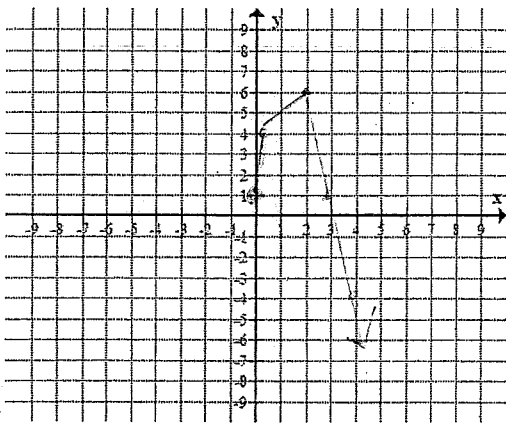
Pre-Calculus 12 – Ch 1 Transformations

3. Given $y = f(x)$ below, sketch the following transformations:



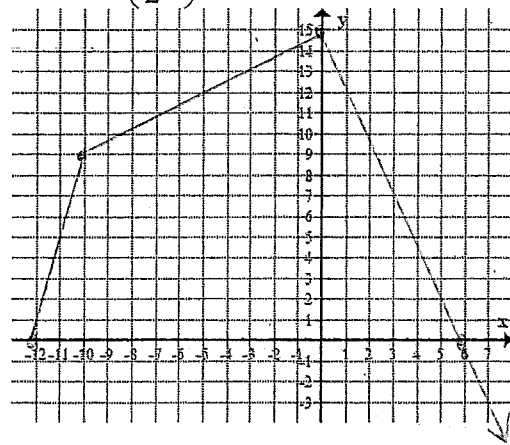
- $f(x)$
- $(-6, 0)$
 - $(-5, 3)$
 - $(0, 5)$
 - $(3, 0)$
 - $(6, -5)$

a) $y = f\left(\frac{1}{3}x + 2, y + 1\right)$
 $y = f(3x - 6) + 1$



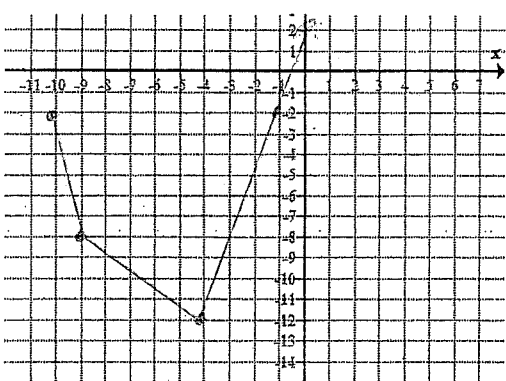
- $(0, 1)$
- $(\frac{5}{3}, 4)$
- $(2, 6)$
- $(3, 1)$
- $(4, -4)$

b) $y = 3f\left(\frac{1}{2}x\right)$ $(2x, 3y)$



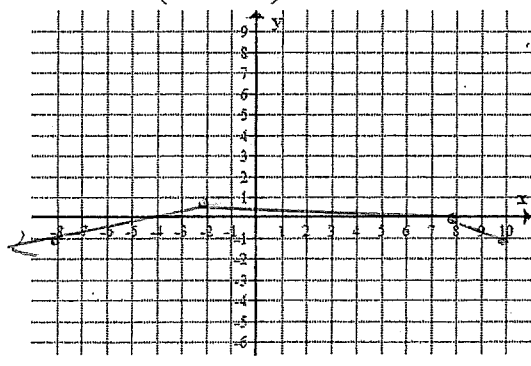
- $(-12, 0)$
- $(-10, 9)$
- $(0, 15)$
- $(6, 0)$
- $(12, -15)$

c) $y = -2f(x + 4) - 2$ $(x - 4, -2y - 2)$



- $(-10, -2)$
- $(-9, -8)$
- $(-4, -12)$
- $(-1, -2)$
- $(2, 8)$

d) $y = \frac{1}{3}f\left(-\frac{1}{2}x - 1\right) - 1$ $y = \frac{1}{3}f\left(-\frac{1}{2}(x + 2)\right) - 1$



- $(-2, \frac{2}{3})$
- $(-8, -1)$
- $(-14, -\frac{8}{3})$
- $(-2, \frac{2}{3})$
- $(6, -1)$

4. The point $(-12, 18)$ is on the graph of $y = f(x)$. What does this point become under each transformation?

a) $y = f(3x - 6) + 1$

$(x, y) \rightarrow (\frac{1}{3}x + 2, y + 1)$
 $(-12, 18) \rightarrow (-2, 19)$

d) $y + 3 = -\frac{1}{3}f(2x + 12)$

$(x, y) \rightarrow (\frac{1}{2}x - 6, -\frac{1}{3}y - 3)$
 $(-12, 18) \rightarrow (-12, -9)$

$(x, y) \rightarrow (-3x, 4y)$

b) $y = 4f\left(-\frac{1}{3}x\right)$

$(-12, 18) \rightarrow (36, 72)$

$(x, y) \rightarrow (x + 6, -2y + 4)$

c) $y = -2f(x - 6) + 4$

$(-12, 18) \rightarrow (-6, -32)$

e) $y = 3f\left(-\frac{2}{3}x - 6\right) - 5$

$(x, y) \rightarrow (-\frac{3}{2}x - 9, 3y - 5)$
 $(-12, 18) \rightarrow (9, 49)$