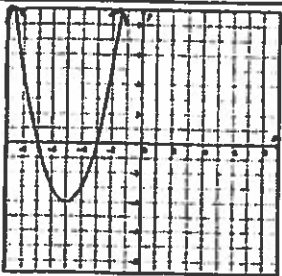1. For each of the following graphs, state whether it represents a function, then give its domain and range.

Function? (yes / no)	Function? (yes / no)	Function? (yes / no)	Function? (yes / no)
Domain:	Domain:	Domain:	Domain:
Range:	Range:	Range:	Range:

2. If $f(x) = 3x - 2$, determine, simplifying your answers where possible:

   a) $f(3)$ b) $f(-2)$ c) $f(2k^3)$ d) $f(4x - 1)$
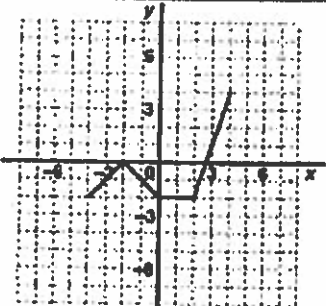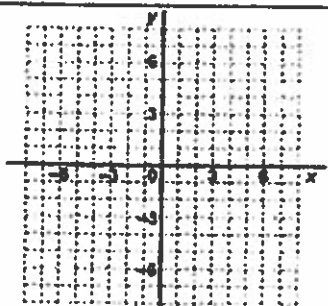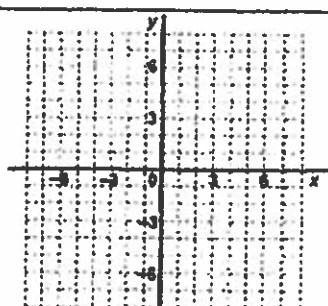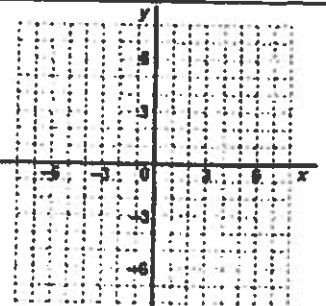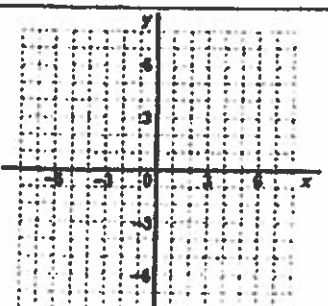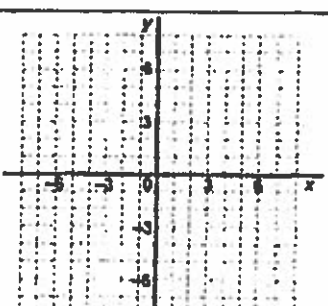
3. If $f(x) = 2x^2 + 3x - 4$, determine, simplifying your answers where possible:

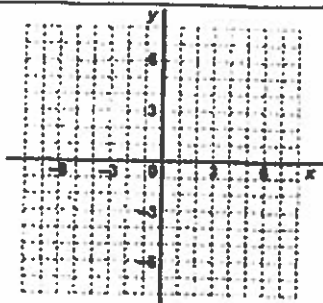   a) $f(3)$ b) $f(-2)$ c) $f(3a - 2)$

4. If $f(x) = \dfrac{2}{x+3}$, determine, *without simplifying answers:*
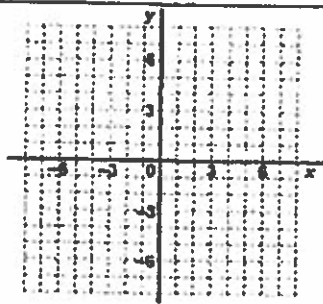
   a) $f(4x)$ b) $4f(x)$ c) $f(a+b)+c$

5. Sketch each of the indicated functions on the grids provided.

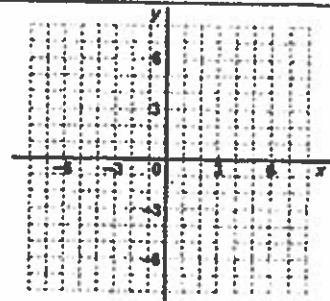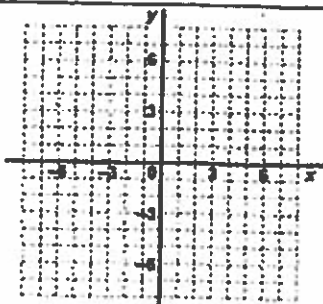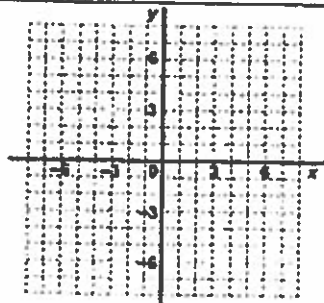|		
a) $y = f(x)$	b) $y = f(x-2)$	c) $y = f(x)+3$
d) $y = f(2x)$	e) $y = \frac{1}{2}f(x)$	f) $y = -f(x)$

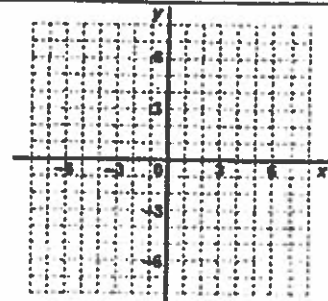g) $y = f(-x)$

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

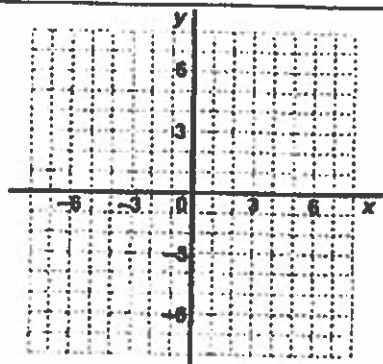i) $y = -2f\left(\frac{1}{2}x\right)$

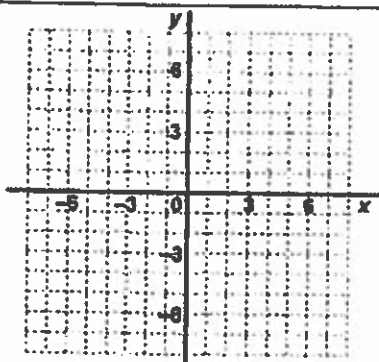j) $y = f(-(x+3)) + 1$

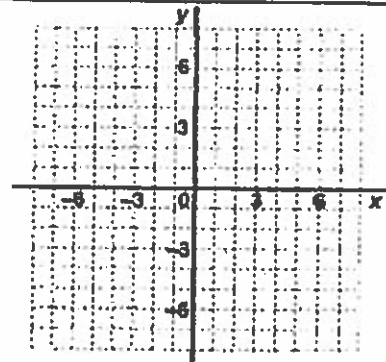k) $y = 2f(2(x-5)) - 4$

l) $y = f^{-1}(x)$

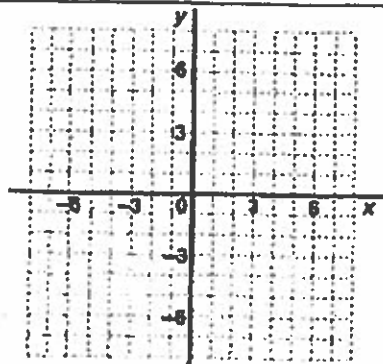6. Sketch each of the indicated functions on the grids provided.
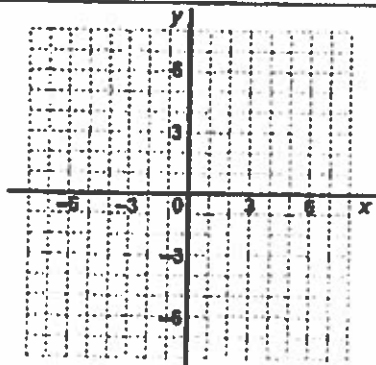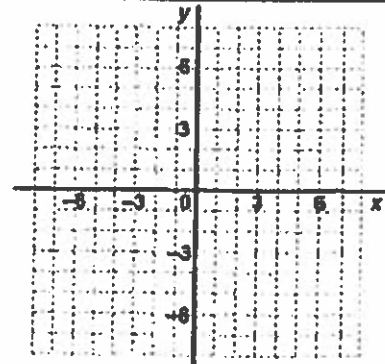
a) $y = 2x^2 - 4$

b) $y = \frac{3}{x}$

c) $y = -\sqrt{x} + 4$
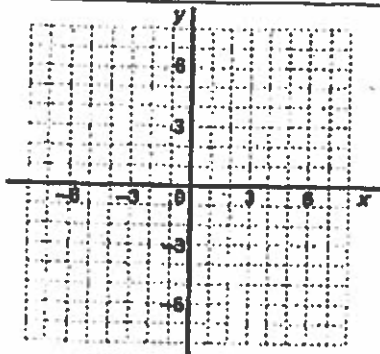
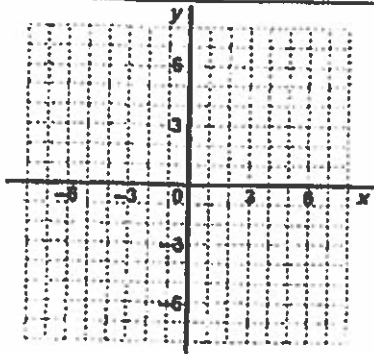d) $y = -\left(\frac{1}{2}x\right)^2 + 3$
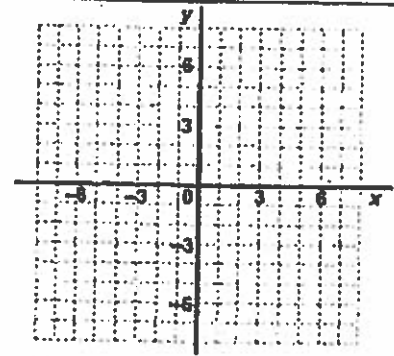
e) $y = 3\sqrt{x+3} - 2$

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

g) $y = 2\sqrt{-x} - 2$ h) $y = -\frac{1}{2}(x+2)^2 + 6$ i) $y = -\sqrt{-(x-2)} + 4$

7. Determine the inverse equation for the following functions.

   a) $y = 5x - 6$

   b) $f(x) = (x+4)^2 - 1$ c) $f(x) = 9x^2 + 1$

8. For $f(x) = \sqrt{x-3}$, write the equations for each of the following, do NOT simplify.

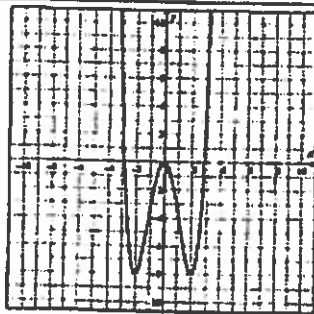   a) $-f(x) =$ b) $f(-x) =$ c) $f(x+7) =$ d) $8f(x) =$

9. Describe how each of the functions below can be obtained from the graph of $f(x)$.
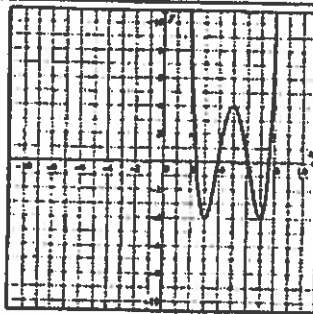
   a) $y = f(x+3) - 7$ b) $y = 3f(-x)$ c) $y = -f\left(\frac{1}{3}x\right) - 4$
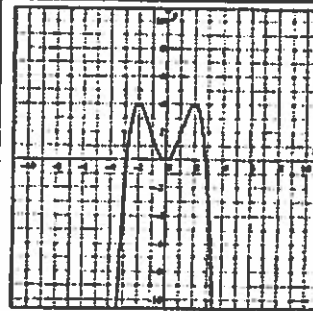
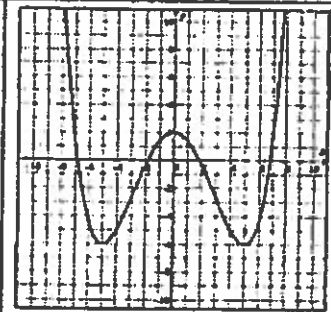10. Given $f(x)$ in the first graph below, give expressions in function notation for the remaining graphs.
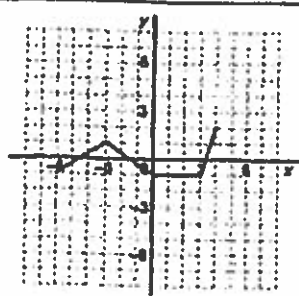

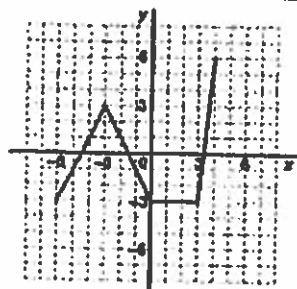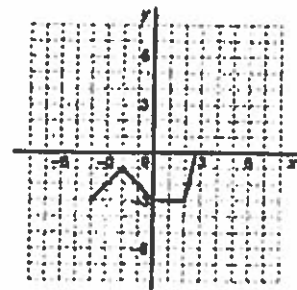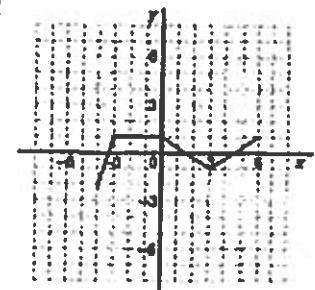Given $y = f(x)$ a) $y =$ b) $y =$ c) $y =$

Given $y = f(x)$ d) $y =$ e) $y =$ f) $y =$

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