

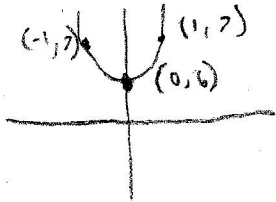
Useful Techniques:

- * Vertical shifts: $y = f(x) + k$ (shift up by k units), $y = f(x) - k$ (shift down by k units), $k > 0$.
- * Horizontal shifts: $y = f(x + h)$ (shift left by h units), $y = f(x - h)$ (shift right by h units), $h > 0$.
- * Symmetry with respect to the x -axis: $y = -f(x)$ [Reflection about the x -axis]
- * Symmetry with respect to the y -axis: $f(-x) = f(x)$, an "Even Function." [Reflection about the y -axis]
- * Symmetry with respect to the origin: $f(-x) = -f(x)$, an "Odd Function."

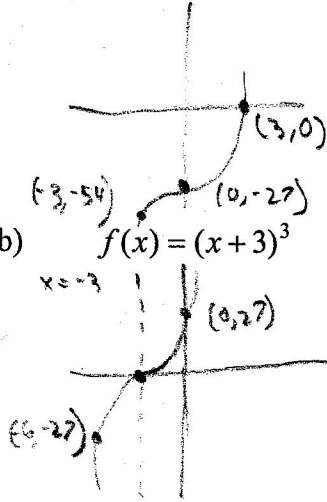
WJ
2/12/08
Qued
Abd

Graph each function using the techniques of shifting, and/or reflecting.
 Label at least three points on the graph, if any.

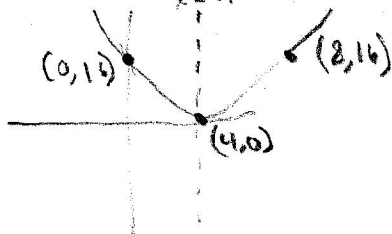
1. a) $f(x) = x^2 + 6$



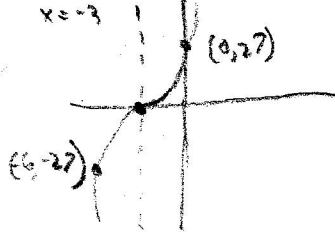
b) $f(x) = x^3 - 27$



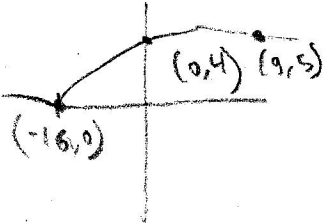
2. a) $f(x) = (x-4)^2 = x^2 - 2x + 16$



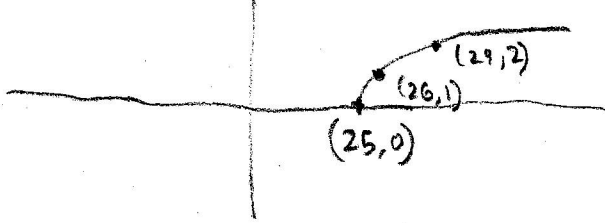
b) $f(x) = (x+3)^3$



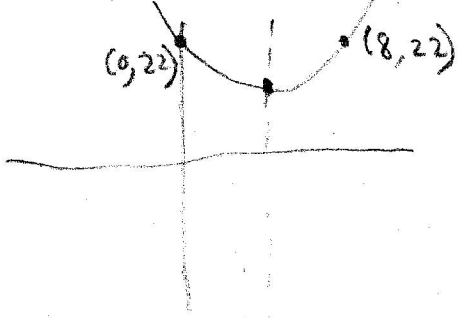
3. a) $f(x) = \sqrt{x+16}$



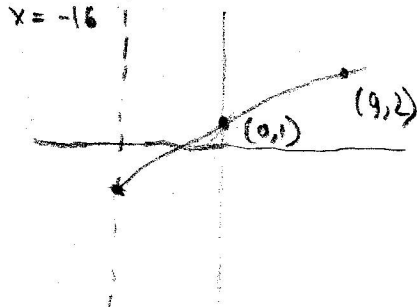
b) $f(x) = \sqrt{x-25}$



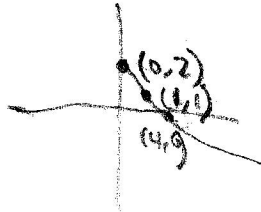
4. a) $f(x) = (x-4)^2 + 6$



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



5. a) $g(x) = -\sqrt{x} + 2$



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

