

COLLEGE ALGEBRA

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GPS #17

2.4 TRANSFORMATIONS OF GRAPHS AND SYMMETRY II

Class Time: _____ Date: _____

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), $h > 0$.
- * Reflection about the x -axis: $y = -f(x)$.
- * Reflection about the y -axis: $y = f(-x)$.
- * Compressing or stretching:
 For $y = af(x)$, $a > 0$ (stretch vertically if $a > 1$ and compress vertically if $0 < a < 1$).
 For $y = f(ax)$, $a > 0$ (compress horizontally if $a > 1$ and stretch horizontally if $0 < a < 1$).

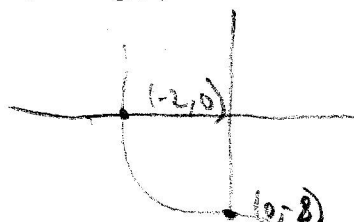
Good job!

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

1. a) $g(x) = -x^2 + 4$



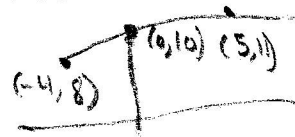
b) $g(x) = -x^3 - 8$



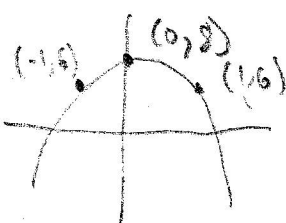
2. a) $f(x) = \sqrt{-x} + 8$



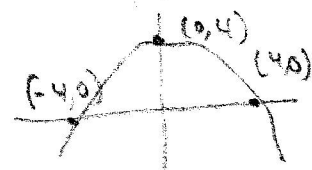
b) $f(x) = \sqrt{x+4} + 8$



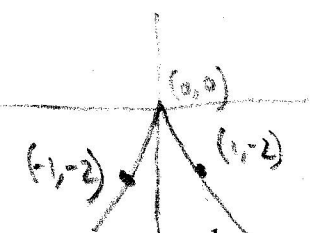
3. a) $f(x) = -2x^2 + 8$



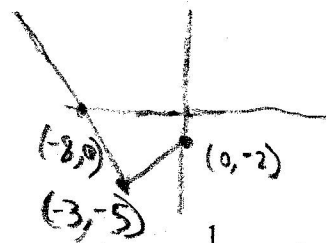
b) $f(x) = -\frac{1}{4}x^2 + 4$



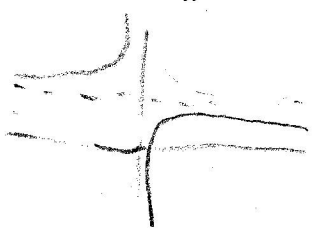
4. a) $f(x) = -2|x|$



b) $f(x) = |x+3| - 5$



5. a) $g(x) = -\frac{1}{x} + 2$



b) $g(x) = \frac{1}{(x-2)} + 4$

