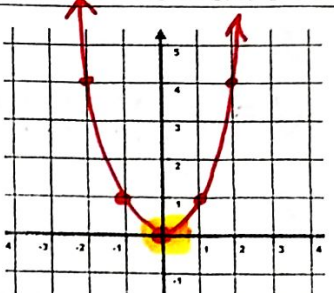
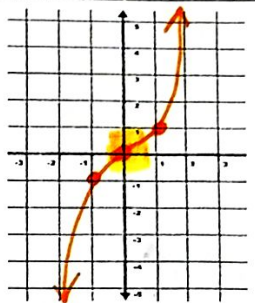
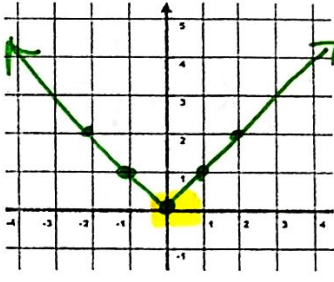
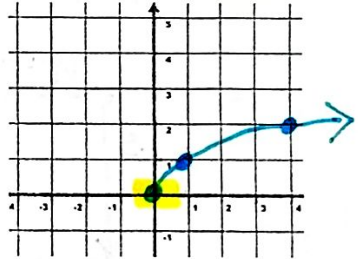
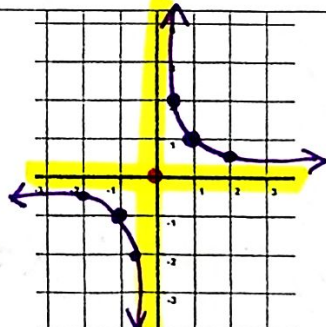
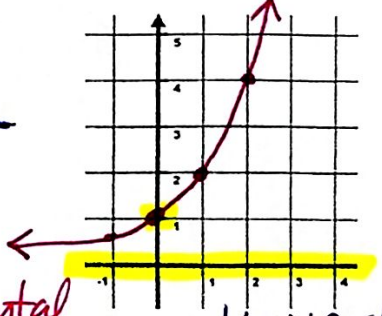


| Parent Function | Graphing Form | Sketch w/Locator Point |
|---|--|---|
| Parabola $y = x^2$ | $y = a(x-h)^2 + k$ |  |
| Cubic $y = x^3$ | $y = a(x-h)^3 + k$ |  |
| Absolute Value $y = x $ | $y = a x-h + k$ |  |
| Square Root $y = \sqrt{x}$ | $y = a\sqrt{x-h} + k$ |  |
| Rational (Hyperbola) $y = \frac{1}{x}$ | $y = a\left(\frac{1}{x-h}\right) + k$ $y = \frac{a}{x-h} + k$ |  |
| Exponential $y = 2^x$ | $y = a(2^{x-h}) + k$ |  |

a = stretches/expands or compresses
 $-a$ = flips graph over x-axis

h = horizontal shift (opposite direction)

k = vertical shift

Transforming Parent Graphs Notes

Example:

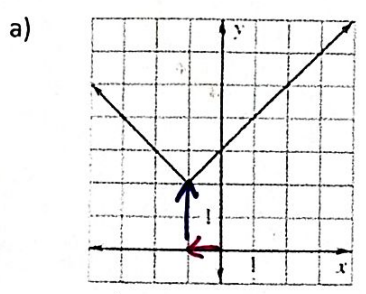
The parent function $y = |x|$ stretched vertically by a factor of 2, shifted left 3 units and down 4 units.

$$y = a|x-h| + k \rightarrow y = 2|x - (-3)| + -4$$

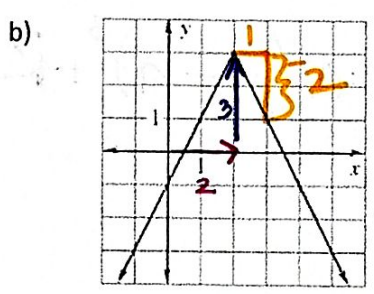
$$y = 2|x + 3| - 4$$

Example:

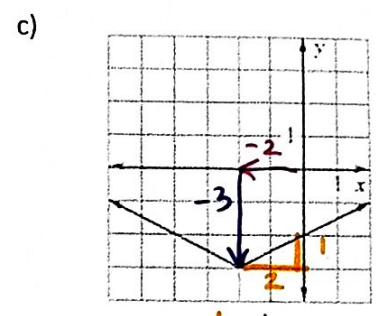
Write an equation for the graphs shown below. Parent function is $y = |x|$.



$$y = |x + 1| + 2$$



$$y = -2|x - 2| + 3$$

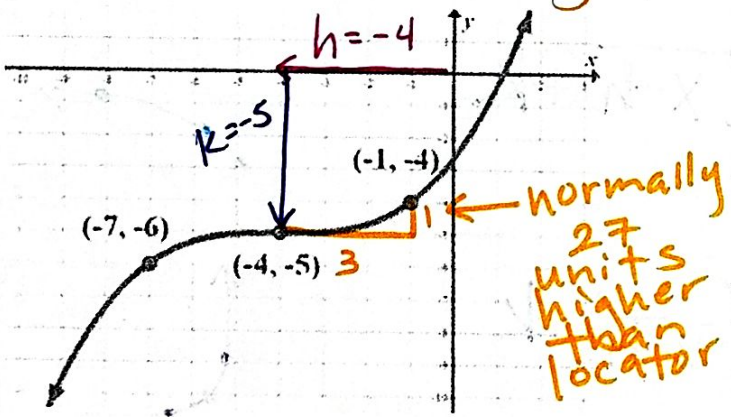


$$y = \frac{1}{2}|x + 2| - 3$$

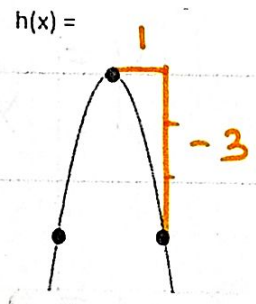
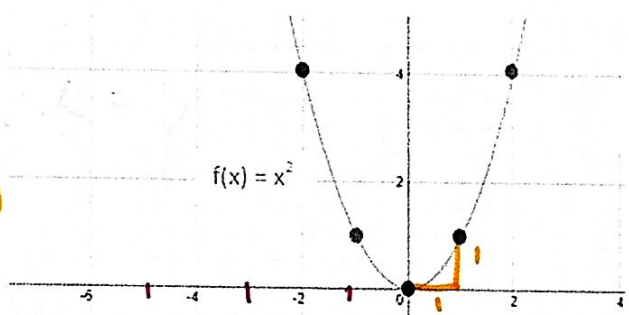
Example:

Write $g(x)$ in terms of $f(x)$ if $f(x) = x^3$.

$$\rightarrow g(x) = a \cdot f(x-h) + k$$



$$g(x) = \frac{1}{27}f(x+4) - 5$$



$$h(x) = -3f(x+5) - 4$$