**Graphing with Transformations.**

**Given a function** $y=f\left(x\right)$

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| **Transformation** | **Change to Parent Graph** |
| $$f\left(x+h\right)$$ | $$Translates f\left(x\right), h units left$$ |
| $$f\left(x-h\right)$$ | $$Translates f\left(x\right), h units right$$ |
| $$f\left(x\right)+k$$ | $$Translates f\left(x\right),k units up$$ |
| $$f\left(x\right)-k$$ | $$Translates f\left(x\right), k units down$$ |
| $$f\left(x\right)$$ | $$Reflects f\left(x\right) about the x-axis$$ |
| $$f\left(-x\right)$$ | $$Reflects f\left(x\right) about the y-axis$$ |
| $$a∙f\left(x\right) and a>1$$ | $$Streches f\left(x\right) vertically$$ |
| $$a∙f\left(x\right) and 0<a<1$$ | $$Compresses f\left(x\right) vertically$$ |
| $$f\left(b∙x\right) and b>1$$ | $$Streches f\left(x\right) horizontally$$ |
| $$f\left(b∙x\right) and 0< b<1$$ | $$Compresses f\left(x\right) horizontally$$ |