1. **State the vertex, axis of symmetry, and the maximum or minimum values of the following functions (the first one is done for you):**
	1. $f\left(x\right)=x^{2}-3$

*Vertex: (0, -3)*

*Axis of symmetry: x= 0*

*Minimum value: y = -3 (min because graph opens up)*

* 1. $f\left(x\right)=-4\left(x+5\right)^{2}-2$
	2. $f\left(x\right)=6\left(x-1\right)^{2}$
1. **Describe the transformations of the graphs compared to** $f\left(x\right)=x^{2}$**. (the first one is done for you)**
	1. $f\left(x\right)=-\frac{1}{3}(x-4)^{2}-3$

*Reflection across the x axis (opens down)*

*Vertical compression of 1/3*

*Shift right 4, shift down 3*

* 1. $f\left(x\right)=-4\left(x+1\right)^{2}$
	2. $f\left(x\right)=\frac{1}{2}\left(x+4\right)^{2}+4$
1. **Graph the following Functions. State the domain and range**

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1. **Rewrite to standard form. Find the axis of symmetry. Find the vertex.**
	1. $y+3x^{2}=6x-4$

$$ y=-3x^{2}+6x-4$$

$$To find axis of symmetry: x=-\frac{b}{2a}$$

$$x=\frac{-6}{2(-3)}$$

$ x=1$ *axis of symmetry*

 *Plug x = 1 into equation to find y*

$$ y=-3\left(1\right)^{2}+6\left(1\right)-4$$

$$ y=-3+6-4$$

$$ y=-1$$

 *Vertex: (1,-1)*

* 1. $y+3x^{2}=6x+4$
1. **Rewrite vertex form to standard form. (first one is done for you)**
	1. $y=-2\left(x-3\right)^{2}+4$

$y=-2\left(x^{2}-6x+9\right)^{}+4$

$y=-2x^{2}+12x-18+4$

$y=-2x^{2}+12x-14$

* 1. $y=-4\left(x+5\right)^{2}+5$
1. ***Write the equation from the graph***

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