Transformations of Relations

Yesterday we reviewed the transformations that you studied in grade 10.

Recall: Reflection along the x-axis: $y=ax^2$, $a<0$ or in function notation: $y=af(x)$, where $f(x)=x^2$.

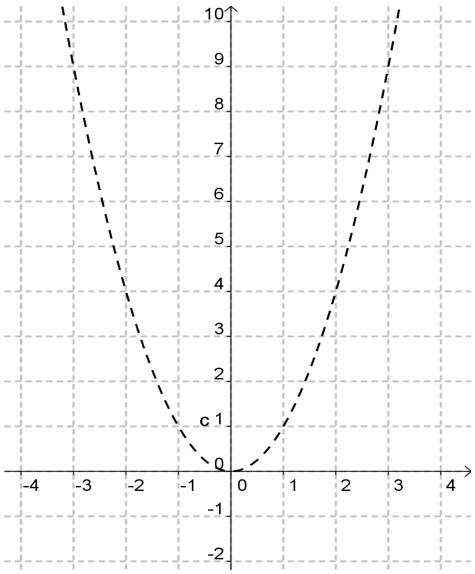
Vertical Scaling: $y=ax^2$, $a>0$ or in function notation: $y=af(x)$, where $f(x)=x^2$.
vertical stretch: $a>1$ *(parabola gets skinnier)*
or vertical compression: $0<a<1$ *(parabola becomes wider)*

Vertical Translation: $y=x^2+q$ or in function notation: $y=f(x)+q$, where $f(x)=x^2$.
vertical shift up: $q>0$ *(parabola moves up)*
or vertical shift down: $q<0$ *(parabola moves down)*

Horizontal Translation: $y=(x-p)^2$ or in function notation: $y=f(x-p)$, where $f(x)=x^2$.
horizontal shift right: $p>0$ *, like in* $y=(x-3)^2$
or horizontal shift left: $p<0$ *, like in* $y=(x+2)^2$

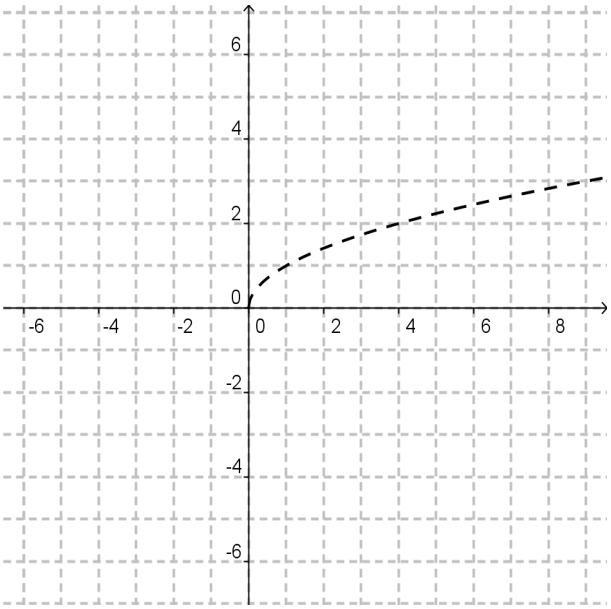
Ex: State the transformations, in the appropriate order, that $y=f(x)$ has undergone to obtain $y=f(x-1)+3$

Using the example above, what if the parent function is a quadratic? Then $f(x)=x^2$.
Sketch the transformed parabola on the grid below.
(Use a table of values if you want to!)

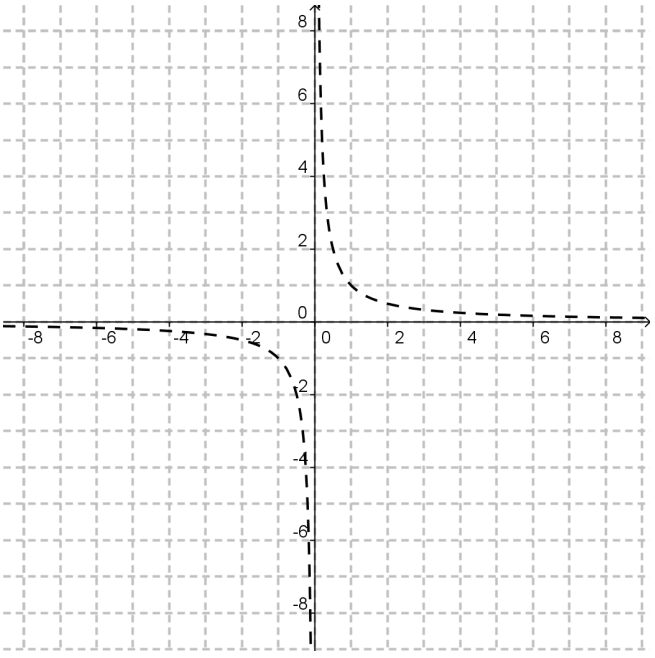


What if the parent function is a set of ordered pairs? If $f(x)=\{(1,2),(2,-3),(-5,7)\}$?
What would $y=f(x-1)+3$ be?
(Use a table of values and/or graph if you want to!)

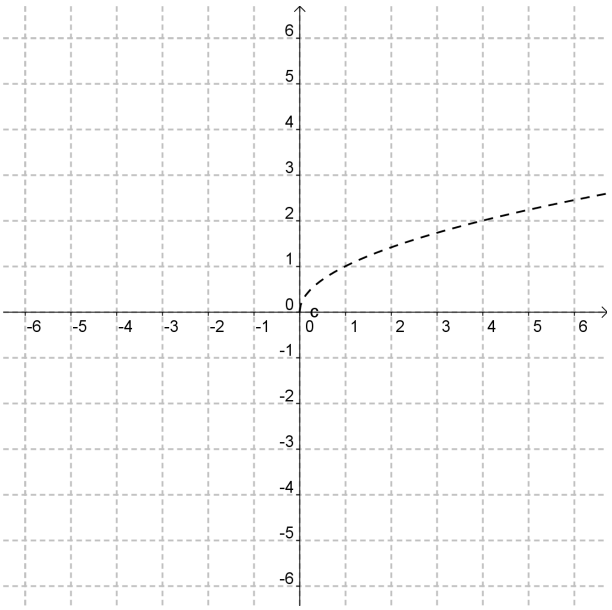
What if the parent function is the square root function?
Then $f(x)=\sqrt{x}$. What would $y=f(x-1)+3$ be?
(Use a table of values and/or graph if you want to!)



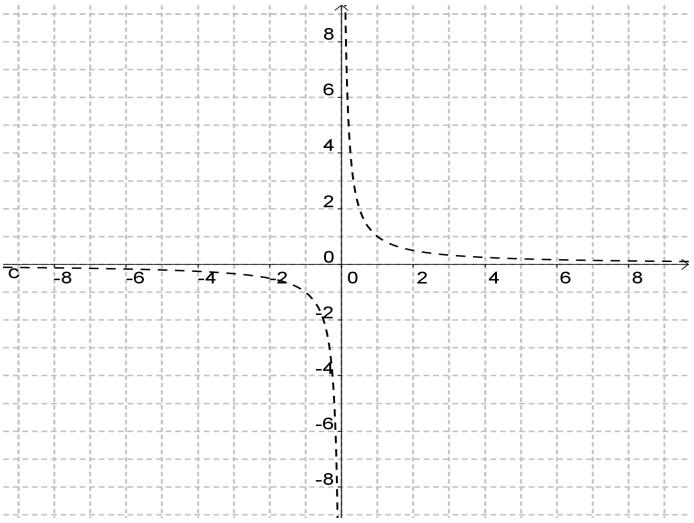
What if the parent function is the reciprocal function?
Then $f(x)=\frac{1}{x}$. What would $y=f(x-1)+3$ be?
(Use a table of values and/or graph if you want to!)



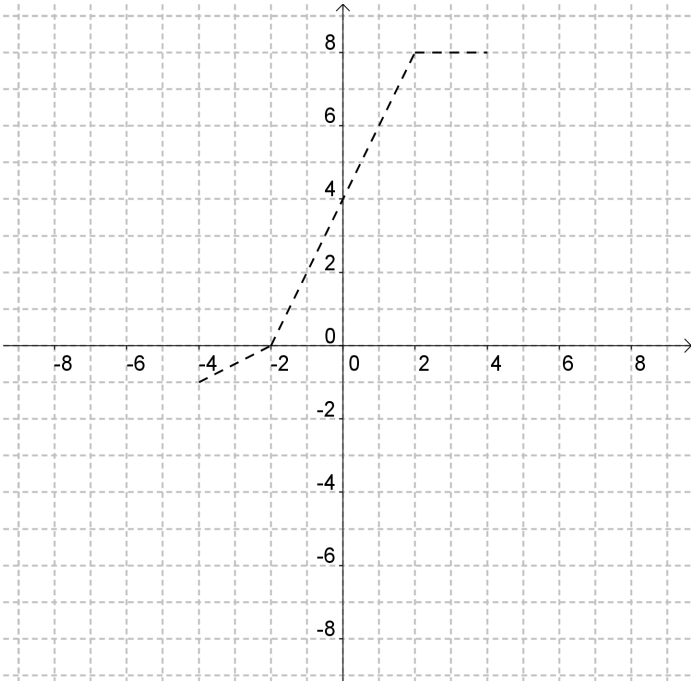
Ex: Given $y=2f(x)+3$ describe the transformations and apply them to the square root function.
(Use a table of values and/or graph if you want to!)



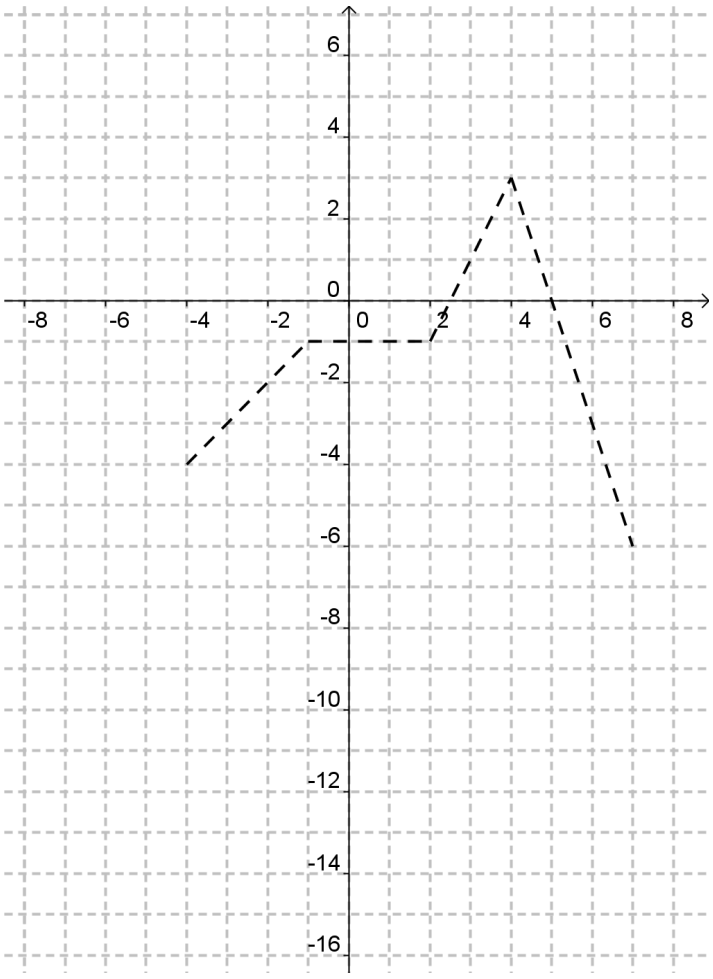
Ex: Given $y=0.4f(x+1)$ describe the transformations and apply them to the reciprocal function.
(Use a table of values and/or graph if you want to!)



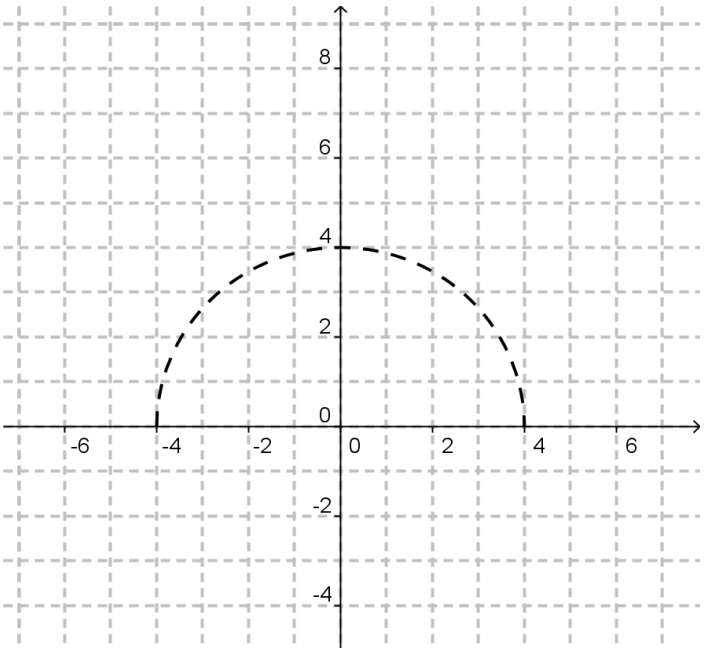
Ex: The graph on the right shows the function $y=f(x)$. Given $y=-f(x+1)-2$, describe the transformations and apply them to the function
(Use a table of values with the key points, if you want to!)



Ex: The graph on the right shows the function $y=f(x)$. Given $y=2f(x)-1$, describe the transformations and apply them to the function.
(Use a table of values with the key points, if you want to!)



Ex: The graph on the right shows the function $f(x)=\sqrt{16-x^2}$. Given $y=-0.5f(x+2)$, describe the transformations and apply them to the function.
(Use a table of values with the key points, if you want to!)



HW: Pg. 241 #8b, 9b, 5abd, 4abce