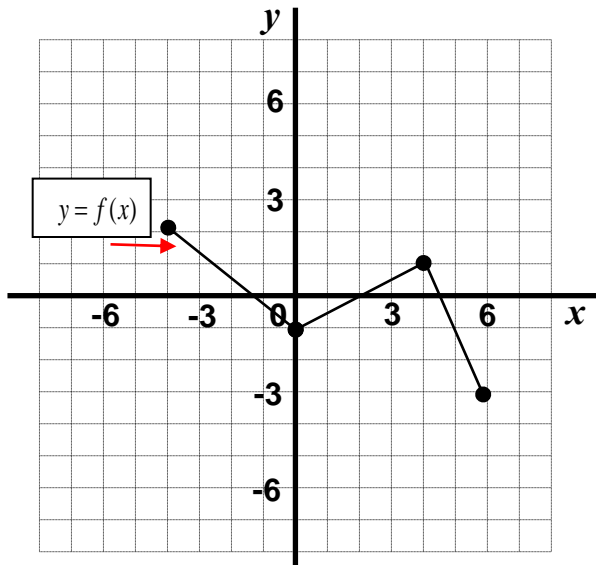


Date:

Vertical Stretches

Given the graph $y = f(x)$, as shown,

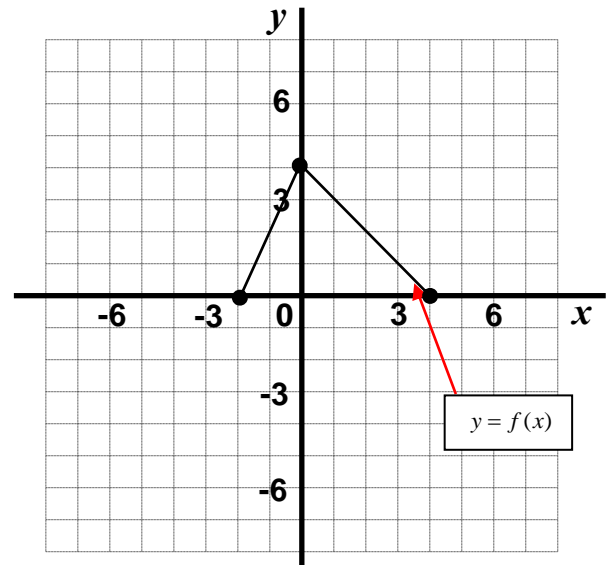
- a) Graph $y = 3f(x)$ on the same axis
- b) Graph $y = 0.5f(x)$ on the same axis



Horizontal Stretches

Given the graph $y = f(x)$, as shown,

- a) Graph $y = f(2x)$ on the same axis
- b) Graph $y = f(0.5x)$ on the same axis



Vertically stretched by a factor of a $y = af(x)$	Expanded vertically Compressed vertically	<i>if $a > 1$</i> <i>if $0 < a < 1$</i>
Horizontally stretched by a factor of $1/a$ $y = f(ax)$	Expanded horizontally Compressed horizontally	<i>if $0 < a < 1$</i> <i>if $a > 1$</i>

Example

Given $y = f(x)$ as shown. Compare the graphs of $y = 3f(x)$, $y = f(0.5x)$ and $y = 3f\left(\frac{1}{2}x\right)$.

