

C12 - 1.5 - Order Matters Point/Functions Notes

$$y = f(x)$$

Find the new point.

$$(x, f(x)) = (2, 4)$$

x	y
2	4

A vertical expansion by a factor of 2

A vertical translation up 2

$$VE = 2 \quad \frac{(2,4)}{(2,8)}$$

$$VT = +2 \quad \frac{(2,8)}{(2,10)}$$

x	y
2	10

A vertical translation up 2

A vertical expansion by a factor of 2

$$VT = +2 \quad \frac{(2,4)}{(2,6)}$$

$$VE = 2 \quad \frac{(2,6)}{(2,12)}$$

Find the new equation.

$$f(x) = x^2$$

x	y
2	4

A vertical expansion by a factor of 2

A vertical translation up 2

$$f(x) = x^2$$

$$y = x^2$$

$$\frac{1}{2}y = x^2$$

$$y = 2x^2$$

$$y - 2 = 2x^2$$

$$y = 2x^2 + 2$$

Put $\frac{1}{2}y$ in for y

Put " $y - 2$ " in for y

x	y
2	10

A vertical translation up 2

A vertical expansion by a factor of 2

$$f(x) = x^2$$

$$y = x^2$$

$$y - 2 = x^2$$

$$y = x^2 + 2$$

$$\frac{1}{2}y = x^2 + 2$$

$$y = 2x^2 + 4$$

Put " $y - 2$ " in for y

Put $\frac{1}{2}y$ in for y

Remember: We always substitute the opposite operation for the variable.

Remember: Order matters. An addition then a multiplication is far different from the same multiplication and then the same addition. **Think about it!**

Remember: Do the operations in the order you are asked or follow DMAS