Function Transformations

Vertical Shift:

Shift Up: Add to Function

Ex: x^2 shifted up by 2 $\Rightarrow (x^2)+2$

Ex: (x^3-5x) shifted up by 3 $\Rightarrow (x^3-5x)+3$

Ex: $(-5x^4-7)$ shifted up by 4 $\Rightarrow (-5x^4-7)+4$

Shift Down: Subtract from Function

Ex: $5x$ shifted down by 4 $\Rightarrow (5x)-4$

Ex: $|3x^3+2|$ shifted down by 3 $\Rightarrow (|3x^3+2|)-3$

Ex: $\sqrt{x^2-6x}$ shifted down by 7 $\Rightarrow (\sqrt{x^2-6x})-7$

Horizontal Shift:

Shift Right: Subtract from every x-value

(Replace every x with $(x-\square)$)

Ex: x^2 shifted right by 5 $\Rightarrow (x-5)^2$

Ex: x^2+4x shifted right by 3 $\Rightarrow (x-3)^2+4(x-3)$

Ex: $\sqrt{x+7}$ shifted right by 2 $\Rightarrow \sqrt{(x-2)+7}$

Shift Left: Add to every x-value

(Replace every x with $(x+\square)$)

Ex: $-3x^3+2x$ shifted left by 5 $\Rightarrow -3(x+5)^3+2(x+5)$

Ex: $(x^2+4x)^{3/2}$ shifted left by 2 $\Rightarrow ((x+2)^2+4(x+2))^{3/2}$

Ex: $|x-7|$ shifted left by 3 $= |(x+3)-7|$