

TRANSFORMATIONS

Transformation	Describe Change to the Equation	$M(x) = x^2$ Write an Example Problem	$A(x) = \sqrt{x}$ Write an Example Problem	$T(x) = x $ Write an Example Problem	$H(x) = x^3$ Write an Example Problem
Horizontal Shift R(t)	Subtract something from x inside the function	$M(x) = (x - 2)^2$	$A(x) = \sqrt{x - 2}$	$T(x) = x - 2 $	$H(x) = (x - 2)^3$
Horizontal Shift (Lt)	Add something to x inside the function	$M(x) = (x + 2)^2$	$A(x) = \sqrt{x + 2}$	$T(x) = x + 2 $	$H(x) = (x + 2)^3$
Vertical Shift (Up)	Add something outside the function. or Subtract something from y	$M(x) - 2 = x^2$ or $M(x) = x^2 + 2$	$A(x) - 2 = \sqrt{x}$ or $A(x) = \sqrt{x} + 2$	$T(x) - 2 = x $ or $T(x) = x + 2$	$H(x) - 2 = x^3$ or $H(x) = x^3 + 2$
Vertical Shift (Down)	Subtract something outside the function. or Add something to the y	$M(x) + 2 = x^2$ or $M(x) = x^2 - 2$	$A(x) + 2 = \sqrt{x}$ or $A(x) = \sqrt{x} - 2$	$T(x) + 2 = x $ or $T(x) = x - 2$	$H(x) + 2 = x^3$ or $H(x) = x^3 - 2$
Horizontal Stretch	Divide x by something inside the function	$M(x) = \left(\frac{x}{2}\right)^2$	$A(x) = \sqrt{\frac{x}{2}}$	$T(x) = \left \frac{x}{2}\right $	$H(x) = \left(\frac{x}{2}\right)^3$
Vertical Compression	Divide x by something outside the function	$M(x) = \frac{1}{2}(x^2)$	$A(x) = \frac{1}{2}\sqrt{x}$	$T(x) = \frac{1}{2} x $	$H(x) = \frac{1}{2}(x^3)$
Horizontal Compression	Multiply x by something inside the function	$M(x) = (5x)^2$	$A(x) = \sqrt{5x}$	$T(x) = x $	$H(x) = (5x)^3$
Vertical Stretch	Multiply x by something outside the function	$M(x) = 2(x^2)$	$A(x) = 2\sqrt{x}$	$T(x) = 2 x $	$H(x) = 2(x^3)$