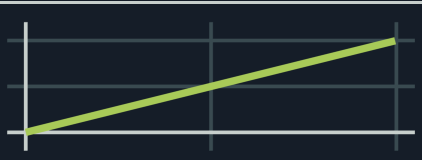
Bouncee maths

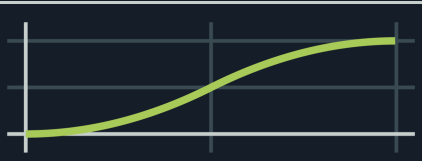
Linear

Name	Function	Domain	Graph
In	$f(x) = x$	$0 \leq x \leq 1$	
Spike	$f(x) = 2x$ $g(x) = 2(1 - x)$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	

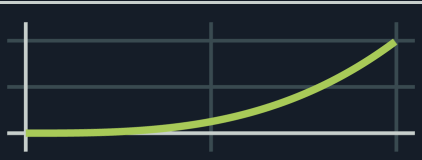
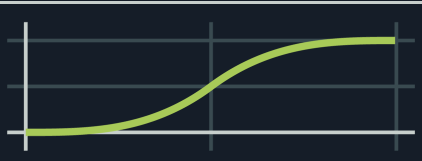
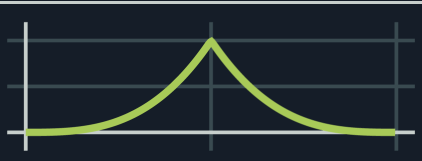
Sinus

Name	Function	Domain	Graph
In	$f(x) = -cos(0.5x\pi) + 1$	$0 \leq x \leq 1$	
Out	$f(x) = sin(0.5x\pi)$	$0 \leq x \leq 1$	
InOut	$f(x) = -0.5cos(x\pi) + 0.5$	$0 \leq x \leq 1$	
Spike	$f(x) = -cos(x\pi) + 1$ $g(x) = cos(x\pi) + 1$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	

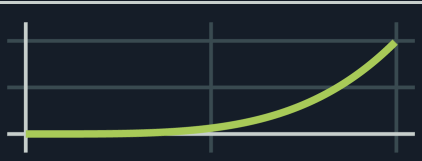
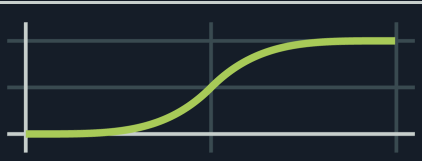
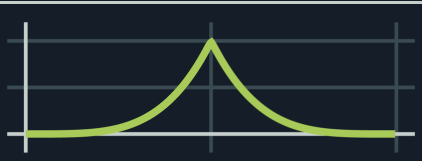
Quadratic

Name	Function	Domain	Graph
In	$f(x) = x^2$	$0 \le x \le 1$	
Out	$f(x) = 1 - (x-1)^2$	$0 \le x \le 1$	
InOut	$f(x) = 2x^2$ $g(x) = 1 - 0.5(2x-2)^2$	$0 \le x \le 0.5$ $0.5 < x \le 1$	
Spike	$f(x) = 4x^2$ $g(x) = (2x-2)^2$	$0 \le x \le 0.5$ $0.5 < x \le 1$	

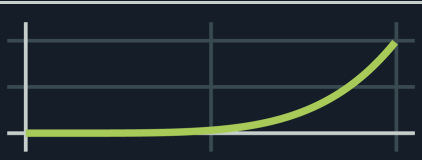
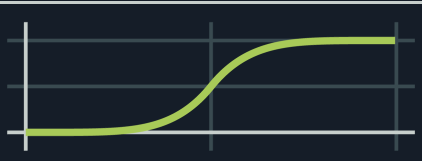
Cubic

Name	Function	Domain	Graph
In	$f(x) = x^3$	$0 \le x \le 1$	
Out	$f(x) = 1 + (x-1)^3$	$0 \le x \le 1$	
InOut	$f(x) = 4x^3$ $g(x) = 1 + 4(x-1)^3$	$0 \le x \le 0.5$ $0.5 < x \le 1$	
Spike	$f(x) = 8x^3$ $g(x) = -(2x-2)^3$	$0 \le x \le 0.5$ $0.5 < x \le 1$	

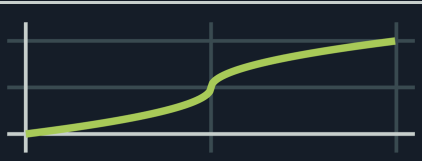
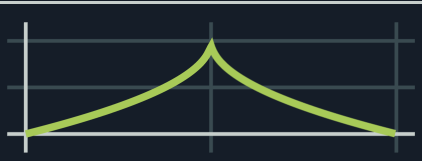
Quartic

Name	Function	Domain	Graph
In	$f(x) = x^4$	$0 \le x \le 1$	
Out	$f(x) = 1 - (x-1)^4$	$0 \le x \le 1$	
InOut	$f(x) = 0.5 - 8(x-0.5)^4$ $g(x) = 0.5 + 8(x-0.5)^4$	$0 \le x \le 0.5$ $0.5 < x \le 1$	
Spike	$f(x) = 16x^4$ $g(x) = (2x-2)^4$	$0 \le x \le 0.5$ $0.5 < x \le 1$	

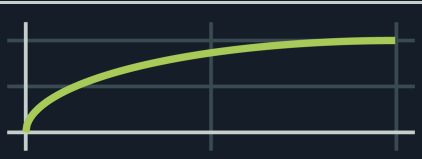
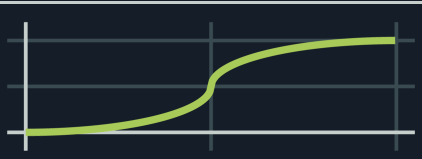
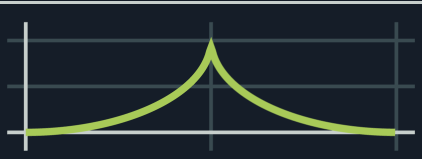
Quintic

Name	Function	Domain	Graph
In	$f(x) = x^5$	$0 \le x \le 1$	
Out	$f(x) = 1 + (x-1)^5$	$0 \le x \le 1$	
InOut	$f(x) = 16x^5$ $g(x) = 1 + 16(x-1)^5$	$0 \le x \le 0.5$ $0.5 < x \le 1$	
Spike	$f(x) = 32x^5$ $g(x) = -(2x-2)^5$	$0 \le x \le 0.5$ $0.5 < x \le 1$	

Exponential

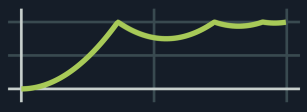
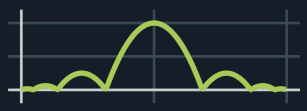
Name	Function	Domain	Graph
In	$f(x) = 1 - \sqrt{1 - x}$	$0 \leq x \leq 1$	
Out	$f(x) = \sqrt{x}$	$0 \leq x \leq 1$	
InOut	$f(x) = 0.5 - 0.5\sqrt{1 - 2x}$ $g(x) = 0.5 + 0.5\sqrt{2x - 1}$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	
Spike	$f(x) = 1 - \sqrt{1 - 2x}$ $g(x) = 1 + \sqrt{2x - 1}$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	

Circular

Name	Function	Domain	Graph
In	$f(x) = 1 - \sqrt{1 - x^2}$	$0 \leq x \leq 1$	
Out	$f(x) = \sqrt{1 - (x - 1)^2}$	$0 \leq x \leq 1$	
InOut	$f(x) = 0.5 - \sqrt{0.25 - x^2}$ $g(x) = 0.5 + \sqrt{0.25 - (x - 1)^2}$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	
Spike	$f(x) = 1 - \sqrt{1 - 4x^2}$ $g(x) = 1 - \sqrt{2x - 2^2}$	$0 \leq x \leq 0.5$ $0.5 < x \leq 1$	

Bounce

s = 7.5625 (scalar that narrows parabola)
d = 2.75 (offset on the x axis)

Name	Function	Domain	Graph
In	$f(x) = 1 - sx^2$ $g(x) = 1 - s(x - \frac{1.5}{d})^2 - 0.75$ $h(x) = 1 - s(x - \frac{2.25}{d})^2 -$ -0.9375 $i(x) = 1 - s(x - \frac{2.625}{d})^2 -$ -0.984375	$0 \leq x < \frac{1}{d}$ $\frac{1}{d} \leq x < \frac{2}{d}$ $\frac{2}{d} \leq x < \frac{5}{4d}$ $\frac{5}{4d} \leq x < 1$	
Out	$f(x) = sx^2$ $g(x) = s(x - \frac{1.5}{d})^2 - 0.75$ $h(x) = s(x - \frac{2.25}{d})^2 - 0.9375$ $i(x) = s(x - \frac{2.625}{d})^2 - 0.984375$	$0 \leq x < \frac{1}{d}$ $\frac{1}{d} \leq x < \frac{2}{d}$ $\frac{2}{d} \leq x < \frac{5}{4d}$ $\frac{5}{4d} \leq x < 1$	
InOut	$f(x) = (1 - (s(1 - 2x - \frac{2.625}{d})^2 +$ $+0.984375))/2$ $g(x) = (1 - (s(1 - 2x - \frac{2.5}{d})^2 +$ $+0.9375))/2$ $h(x) = (1 - (s(1 - 2x - \frac{1.5}{d})^2 + 0.75))/2$ $i(x) = (1 - (s(1 - 2x)^2))/2$ $j(x) = (0.5 + (s(1 - 2x)^2))/2$ $k(x) = (0.5 + (s(1 - 2x - \frac{1.5}{d})^2 + 0.75))/2$ $l(x) = (0.5 + (s(1 - 2x - \frac{2.5}{d})^2 +$ $+0.9375))/2$ $m(x) = (0.5 + (s(1 - 2x - \frac{2.625}{d})^2 +$ $+0.984375))/25$	$0 \leq x < \frac{1}{2d}$ $\frac{1}{2d} \leq x < \frac{1}{d}$ $\frac{1}{d} \leq x < d$ $d \leq x < \frac{2}{d}$ $\frac{2}{d} \leq x < \frac{5}{4d}$ $\frac{5}{4d} \leq x < \frac{5}{2d}$ $\frac{5}{2d} \leq x < 0.5$ $0.5 \leq x < 1$	
Spike	$f(x) = 1 - (s(1 - 2x - \frac{2.625}{d})^2 +$ $+0.984375)$ $g(x) = 1 - (s(1 - 2x - \frac{2.5}{d})^2 +$ $+0.9375)$ $h(x) = 1 - (s(1 - 2x - \frac{1.5}{d})^2 + 0.75)$ $i(x) = 1 - (s(1 - 2x)^2)$ $j(x) = 1 - (s(1 - 2(1 - x) - \frac{1.5}{d})^2 + 0.75))$ $k(x) = 1 - (s(1 - 2(1 - x) - \frac{2.5}{d})^2 +$ $+0.9375))$ $l(x) = 1 - (s(1 - 2(1 - x) - \frac{2.625}{d})^2 +$ $+0.984375)$	$0 \leq x < \frac{1}{2d}$ $\frac{1}{2d} \leq x < \frac{1}{d}$ $\frac{1}{d} \leq x < d$ $d \leq x < \frac{5}{4d}$ $\frac{5}{4d} \leq x < \frac{5}{4d}$ $\frac{5}{4d} \leq x < \frac{5}{2d}$ $\frac{5}{2d} \leq x < 0.5$ $0.5 \leq x < 1$	

Elastic

Back

Polynomial shaping:

Inverted Cos

Double Cubic

Double Cubic Blend

Double Odd