

# Arithmetic Sequence

Recursive Formula - general

all  
arithmetic  
sequences

$$a_1 = a$$

$$a_n = a_{n-1} + d$$

Recursive Formula - Particular  
sequence

given:  $a = 2$

$$d = 5$$

one  
arithmetic  
sequence

$$a_1 = 2$$

$$a_n = a_{n-1} + 5$$

thw for Mon. Does the  
graph stretch or shrink  
Mom ( $y=x^2$ )?

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In the end, what pattern  
do you see? Is there a  
"cutoff" - some # exists  
such that  $>$  one thing  
 $<$  another thing

$$y = \pm m x^2$$

$m_0$   
 $\uparrow$  is there a value of  
 $m$  such that:

$m > m_0$  stretch  
(shrink)?

$m < m_0$  shrink  
(stretch)

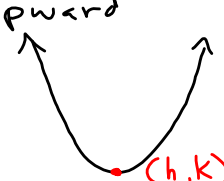

1.  $y = 5x^2$  stretch X shrink
2.  $y = 2x^2$  stretch X shrink
3.  $y = 1.5x^2$  stretch X shrink
4.  $y = 0.8x^2$  stretch    shrink X  
 (transition stretch  $\rightarrow$  shrink)
5.  $y = 0.2x^2$  stretch    shrink X
6.  $y = -5x^2$  stretch X shrink

What is the switch-point between stretch and shrink  $y = \pm ax^2$

$|a| < 1$  vertical shrink  
 $|a| > 1$  vertical stretch

Topic: Quadratic fcn's -  
 domain, range, vertex,  
 axis of symmetry,  
 minimum, maximum

2 kinds of parabola

	opening upward	opening downward
		
Domain	$\mathbb{R}^*$	$\mathbb{R}$
Range	$y \geq k$	$y \leq k$
Vertex	$(h, k)$	$(h, k)$
Minimum	$k$	no min.
Maximum	no max	$k$
Axis of Symm.	$x = h$	$x = h$

\* all real #s  $x$  (inputs)

Topic: vertex form.

$$y = a(x-h)^2 + k$$

$\uparrow$  stretch or shrink factor  
 $\uparrow$  x-value of vertex  
 $\uparrow$  y-value of vertex  
 $|a| > 1$  stretch  
 $|a| < 1$  shrink

if you see this form, you can read the vertex

Example:  $y = -3(x+5)^2 + 7$   
 opening down  
 vertex  $(-5, 7)$   
 $h$  '  $k$