MATH 100. Comparing Linear, Quadratic, Exponential, and Power Functions

We have been considering functional relationships between pairs of quantities that we represent by variables. We are learning to characterize some special kinds of functions by analyzing patterns of change.

We have employed the concepts of change, rate of change, and percent change.

We have utilized words, tables, graphs, and formulas to represent functions and to aid in our analysis.

Linear: y = mx + b

Significance of m:

Significance of b:

Quadratic: y = ax^2 + bx + c

Significance of a:

Significance of c:

Significance of (-b/2a):

Significance of $\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$:

Exponential: y = P(c)^x = P(1 + r)^x

Significance of P:

Significance of c:

Significance of r:

Power: y = kx^p

Significance of k:

Significance of p:

Examples:

Consider the three functional relationships shown below. One is linear, one is exponential, and one is a power function. Identify each relationship by type and determine a formula for each relationship. In each case, determine the value of y when x = 5.

Δx	x	y	Δy
	0	3	
	1	7	
	2	11	
	3	15	
	4	19	
	5		

Δx	x	y	Δy	Ratio
	0	0		
	1	3		
	2	24		
	3	81		
	4	192		
	5			

Δx	x	y	Δy	Ratio
	0	100		
	1	130		
	2	169		
	3	220		
	4	286		
	5			

Δx	x	y	Δy	ΔΔy
	0	-4		
	1	4		
	2	18		
	3	38		
	4	64		
	5			