Day 25: Linear vs. Exponential vs. Quadratic

Look closely at these TABLES. Describe any patterns you notice.

These have a linear relationship:

x	y
-1	9
0	12
1	15
2	18

x	y
-1	95
0	88
1	81
2	74

Describe patterns:

Constant slopes of 3 and −7

These have an exponential relationship:

x	y
-1	128
0	64
1	32
2	16

x	y
-1	3
0	12
1	48
2	192

Describe patterns:

Constant factors of 1/2 & 4

These have a quadratic relationship:

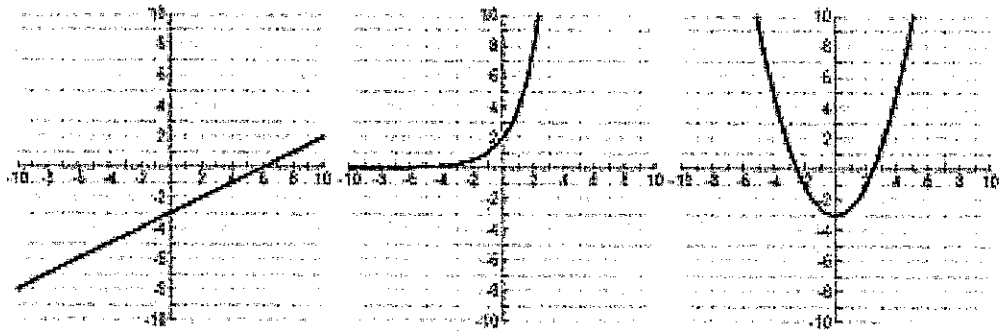
x	y
-1	0
0	1
1	4
2	9

x	y
-1	-6
0	0
1	2
2	0

Explain how you can identify if a relationship is linear, exponential, or linear from a table of values?

Linear = Constant slope
Expo = Constant factor
Quadratic = Neither

Look closely at these GRAPHS.



Linear Exponential Quadratic

Explain how you can tell if a graph is linear, exponential, or quadratic.

Straight line. | Hockey Stick | Smiley Face

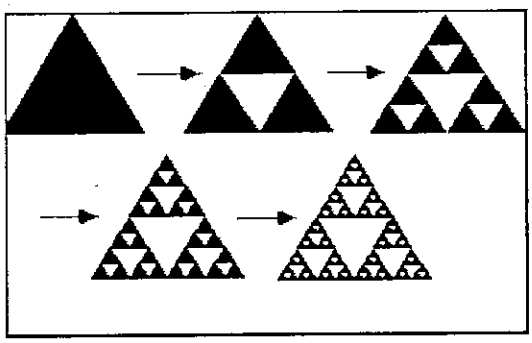
Equations

These are linear equations:	These are exponential equations:	These are quadratic equations:
$y = -\frac{1}{2}x + 8$	$y = 3^x$	$y = x^2$
$2x + 3y = -15$	$y = 4 \cdot (0.8)^x$	$y = 2x^2 - 4x + 6$
$x = 5$	$y = 7(\frac{3}{2})^x + 2$	$f(x) = 3(x-4)^2 + 7$

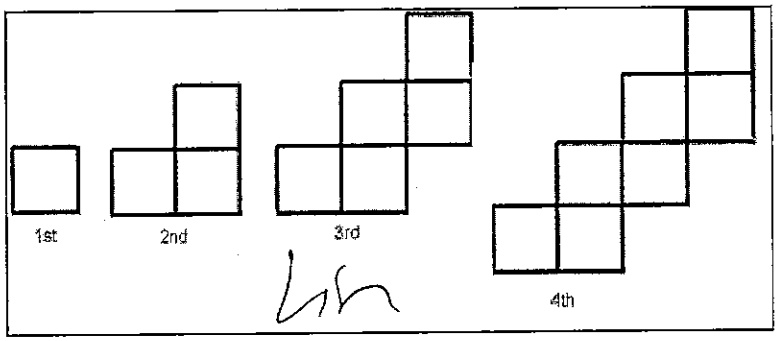
Explain how you can tell if an equation is linear, exponential, or quadratic.

Linear: No exponents | Expo: Exponent of x | Quad: Exponent of 2

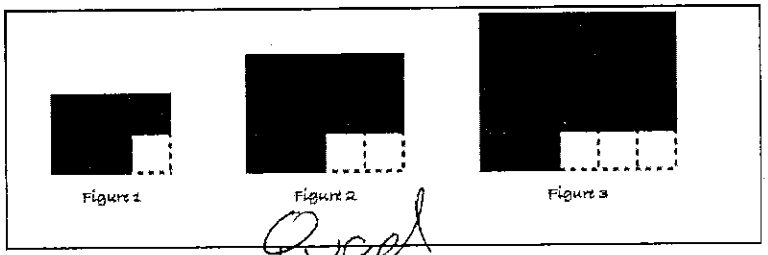
Look closely at TILE PATTERNS. Figure out which is linear, exponential, and quadratic.



Exp



Lin



Quad

Explain how you can tell if a TILE PATTERN is linear, exponential, or quadratic.

Lin: Add same amount | Exp: Mult. same amount | Quad: Area pattern

<u>Bonus:</u> Write a rule for each pattern. Describe what the variables in your rule stand for.

Lin: $y = 2x - 1$

Exp: $y = 1(3)^x$

Quad: $y = (x+1)(x+2) - x$

<u>Spicy Bonus:</u> Which pattern will exceed 10,000 first? How do you know? What about last?

Exp first & lin last