Function Differences

The following tables show the values of linear, quadratic, and exponential functions at various values of x. Indicate which function type corresponds to each table. Justify your choice.

A		B		C		D	
x	$f(x)$	$g(x)$	x	x	$h(x)$	x	$m(x)$
1	6	7	1	1	6	1	56
2	9	14	2	2	9	2	28
3	12	28	3	3	14	3	14
4	15	56	4	4	21	4	7

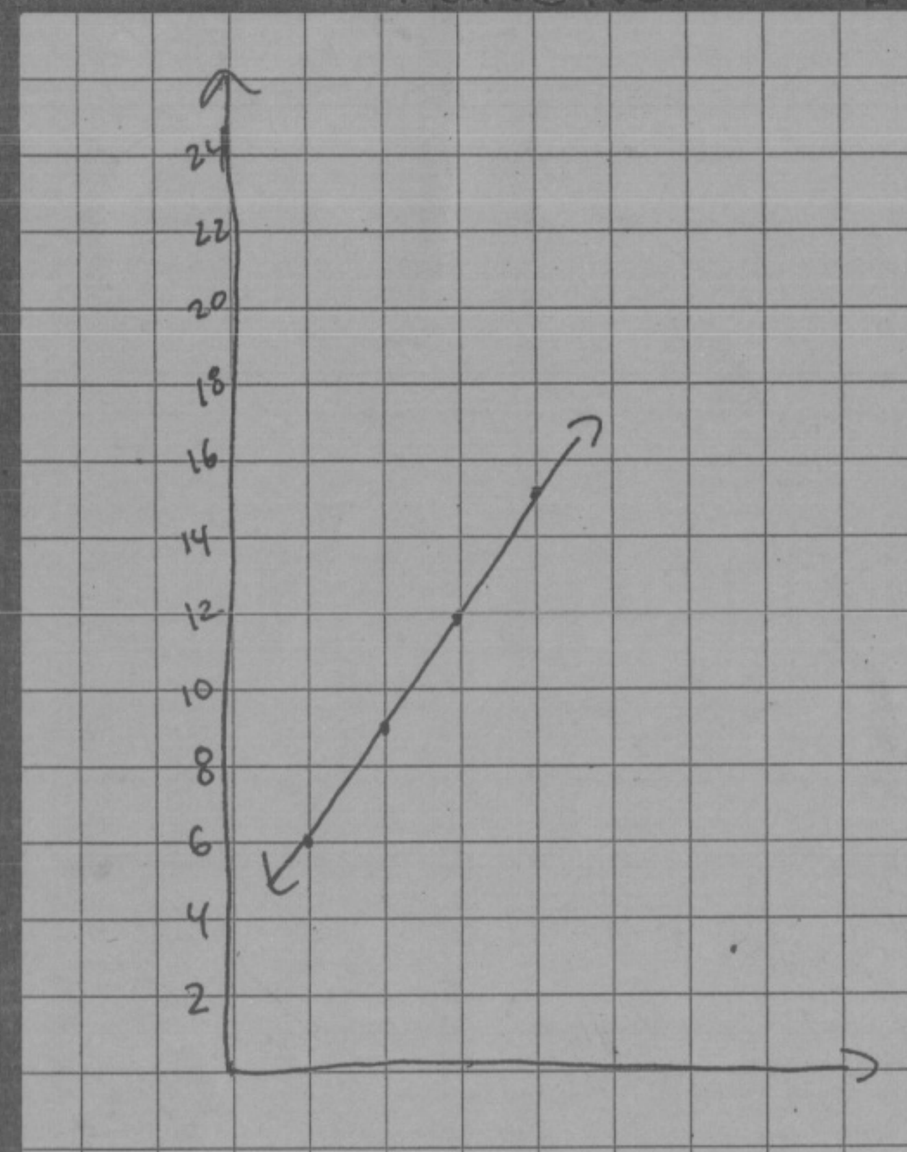
Table A: $f(x) =$ _____

Table B: $g(x) =$ _____

Table C: $h(x) =$ _____

Table D: $m(x) =$ _____

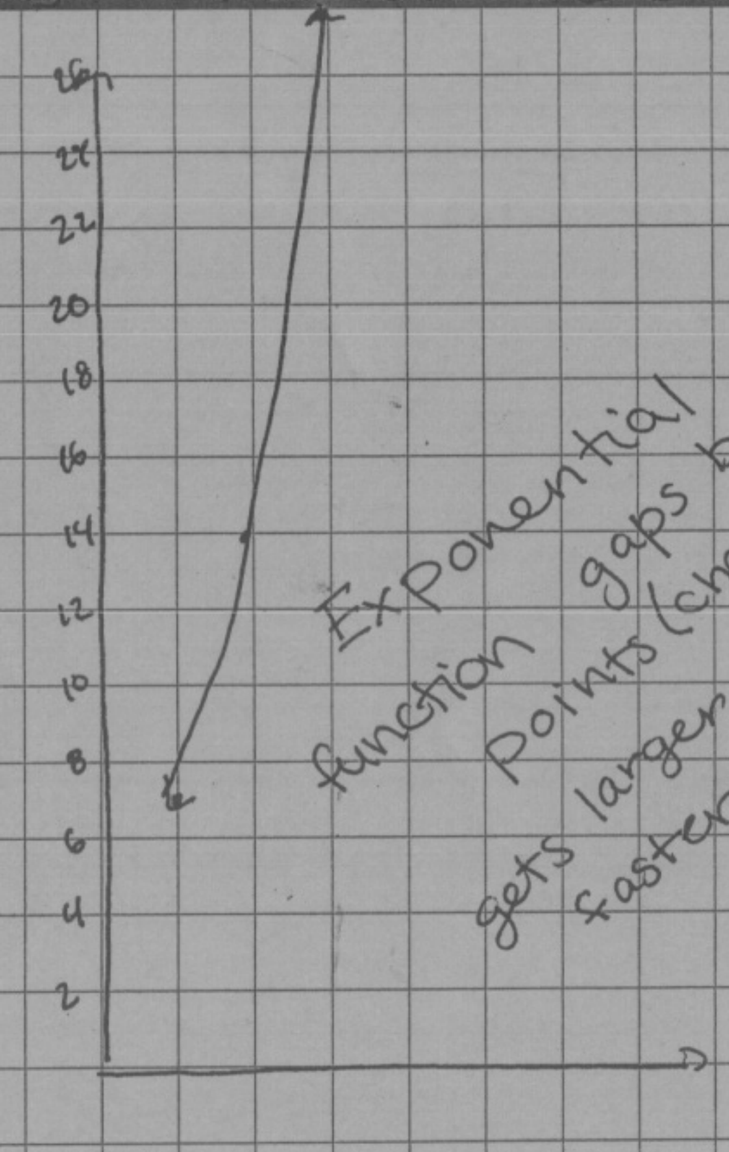
Function A [$L^+(x)$]



Linear

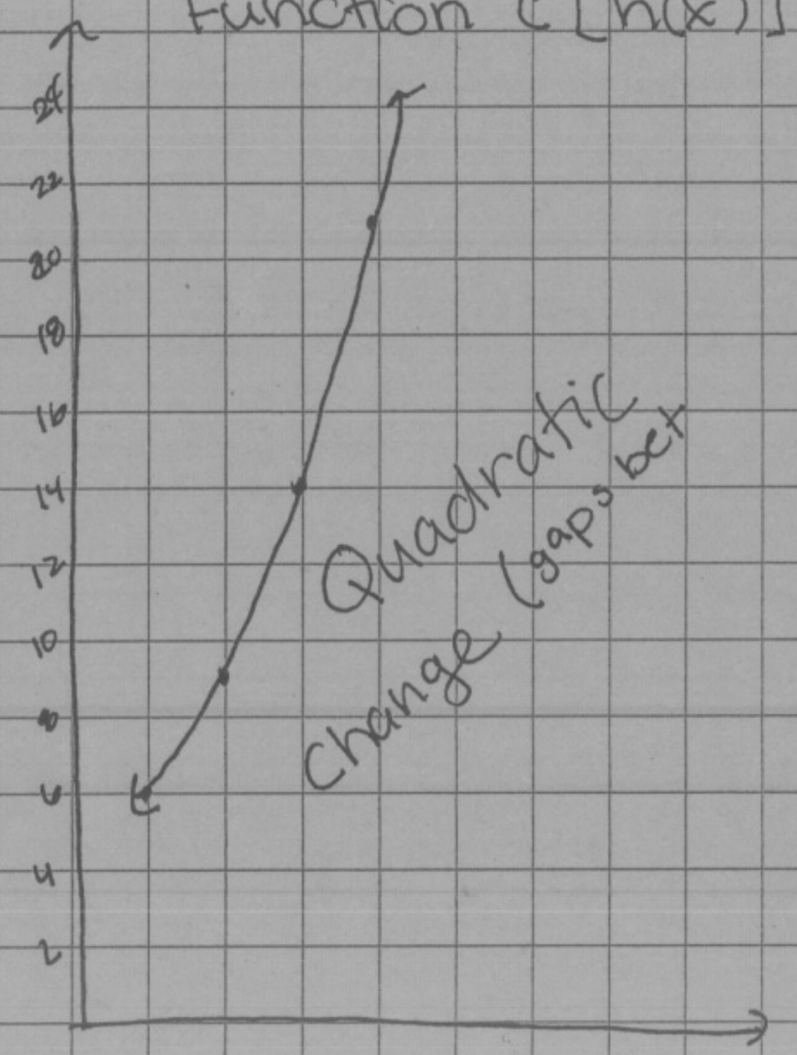
constant change

Function B [$J(x)$]



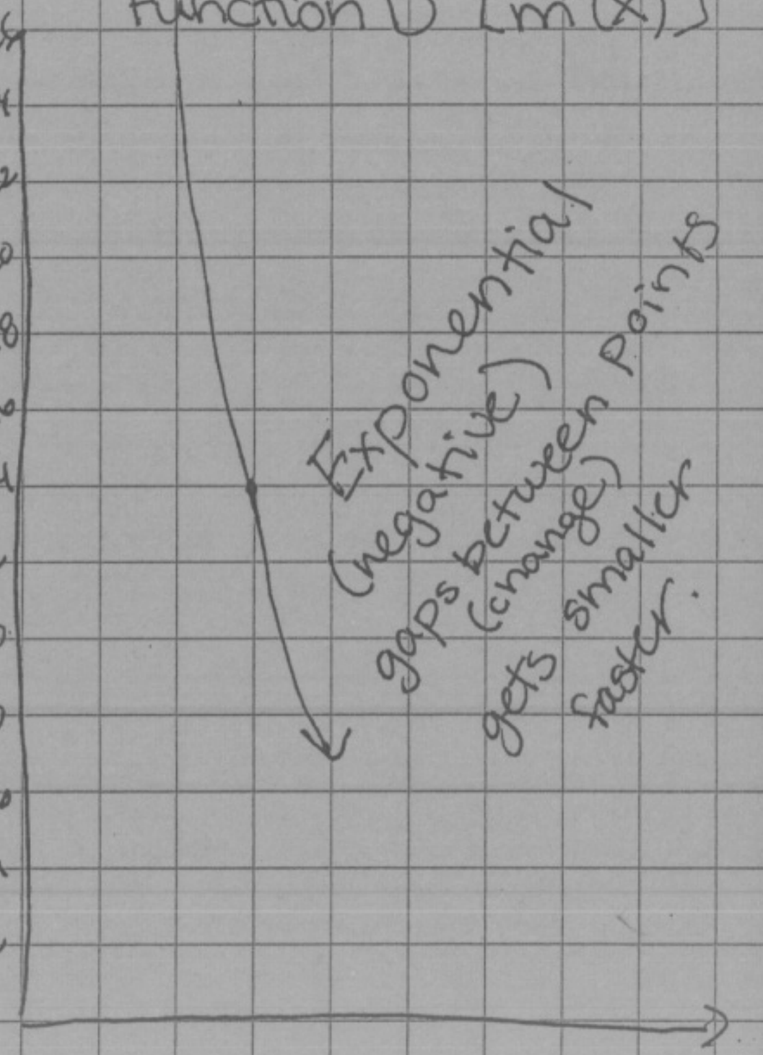
Exponential function gaps between Points (change) gets larger faster.

Function C [$h(x)$]



Quadratic Change (gaps bet

Function D [$m(x)$]



Exponential (negative) gaps between points (change) gets smaller faster.

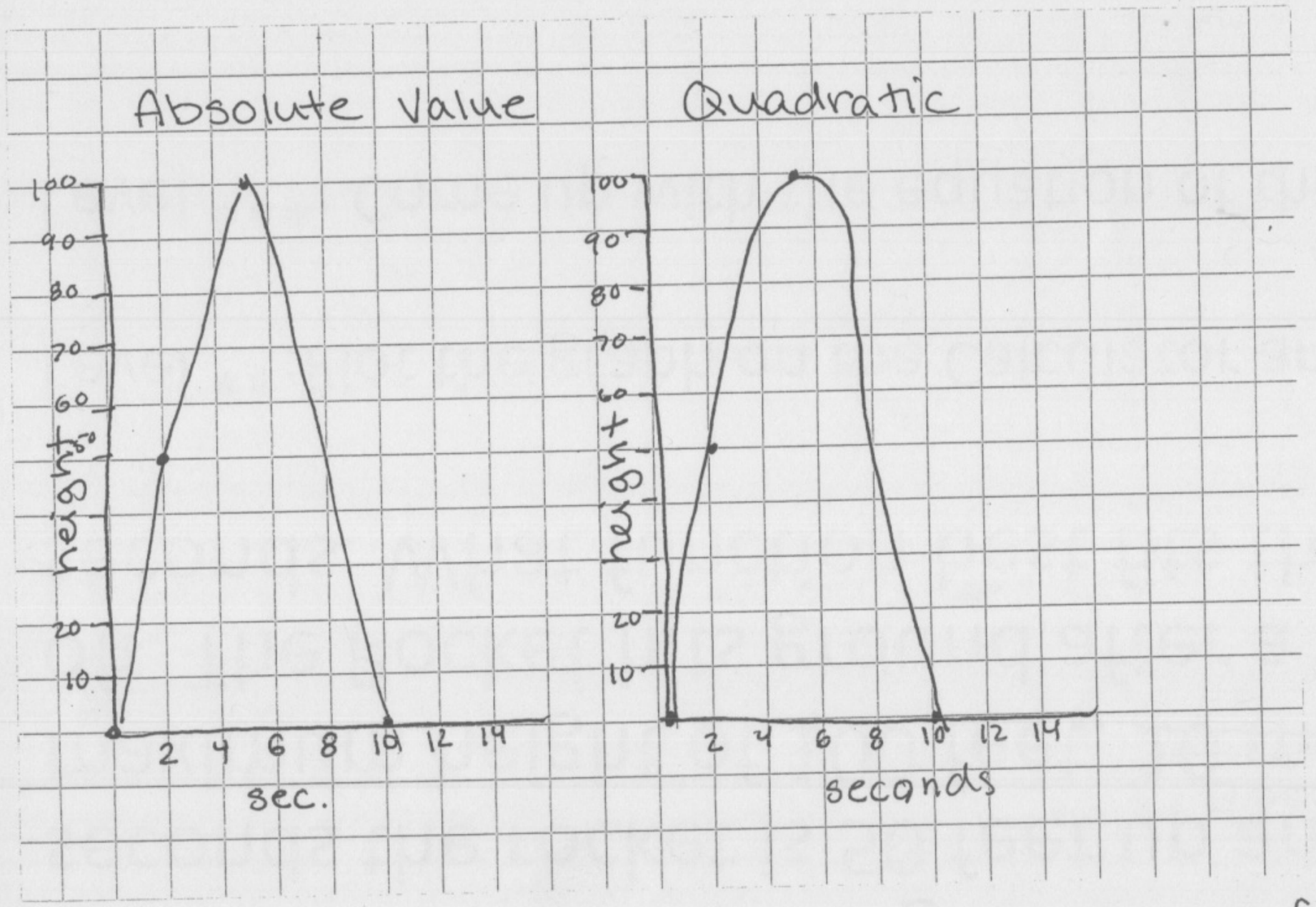
Rocket

A rocket is set off from ground level. After 2 seconds the rocket is 50 feet up and it hits it's maximum height of 100 feet, ~~10 minutes~~ 5 seconds after take off. The Rocket hits ground after a total of 10 seconds. What function best fits this graph?

Level **:Plot the graph on the Calculator and name Function

Level ***: Come up with the equation of the graph.

Approach: I will begin by plotting points on the graphs below to see what fits best.



By just looking at the points it can be either an absolute value function or a Quadratic.

-Since whenever I throw something it looks more like an upside down parabola.

* for a function I know

$y = -x^2$ ← upside down

not exact, but okay for now!

above and beyond

I know that the roots are at 0 and 10 so the factors are x and $x-10$

$y = -x(x-10)$ ~~Speeds~~ Factors

I graphed on calc does not work, but to stretch it I can multiply $-1 \cdot -4x(x-10) = -4x^2+40x$

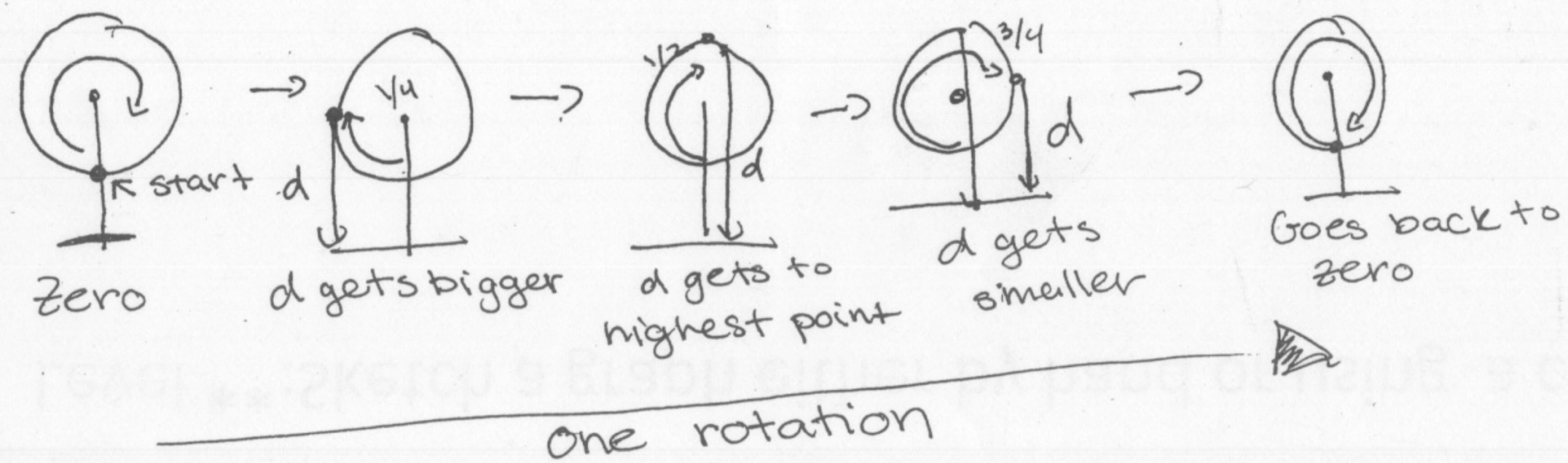
Ferris Wheel

Annie gets on a Ferris Wheel. After 5 mins she is 40 feet up. 10 mins in she hits the highest point of the wheel that is 80 feet up. Map her height off the ground as she makes two complete rotations.

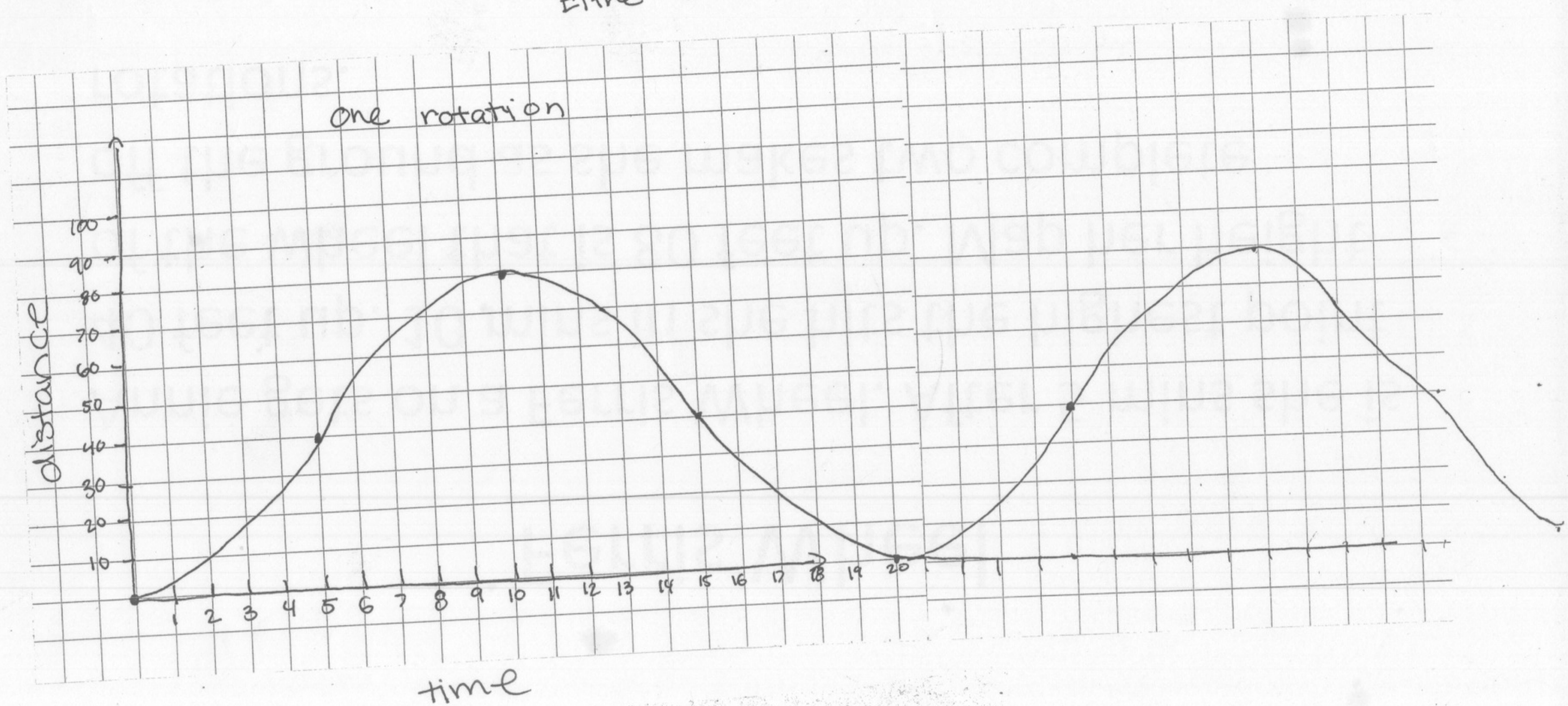
Level **:Sketch a graph either by hand or using a calculator

Approach:

I know a Ferris wheel goes around



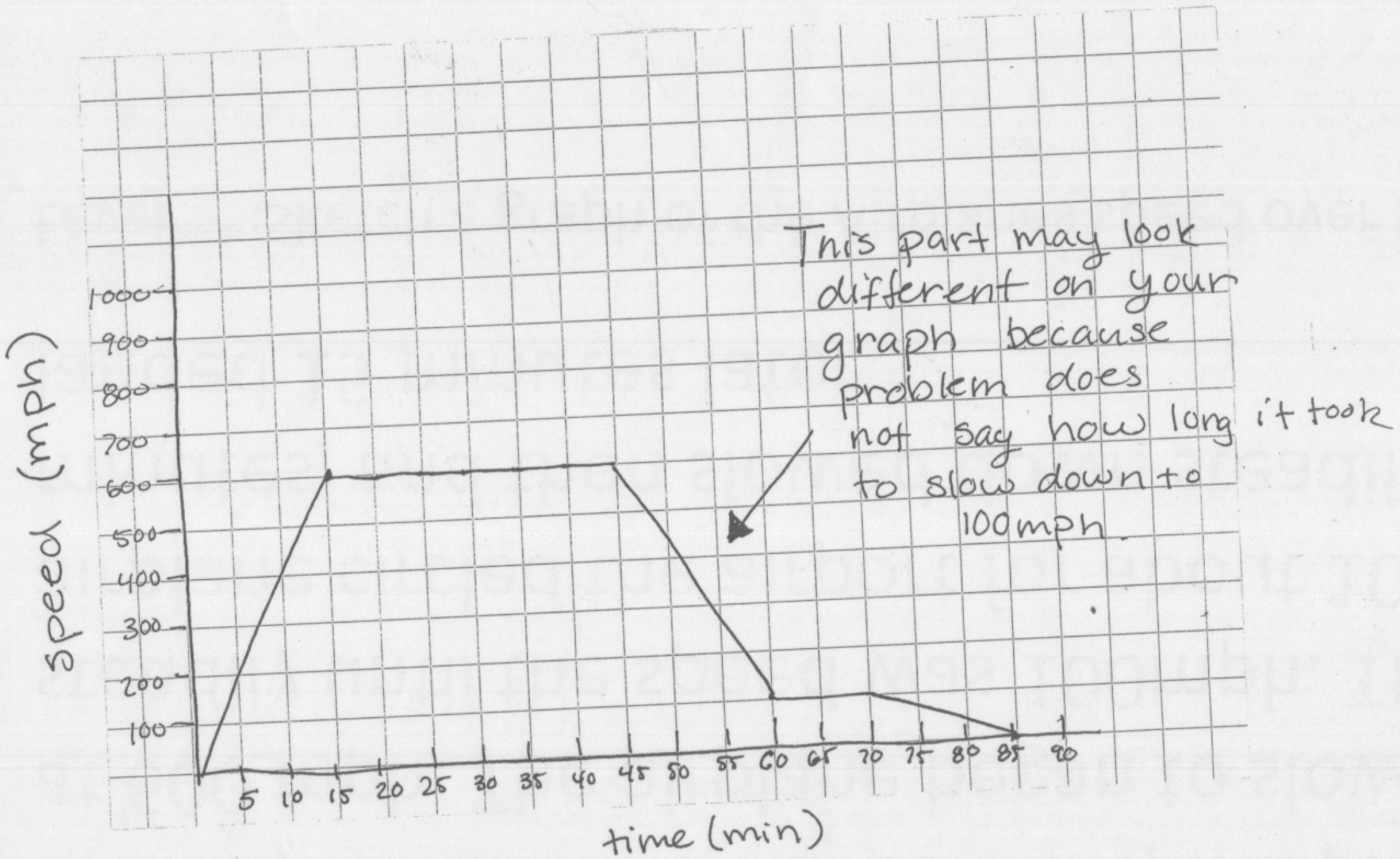
Either sine or cosine



Airplane Take off

An airplane took off and increased speed steadily for 15mins. For 30 mins, the plane flew at 600 mph. The airplane began to slow down steadily until the speed was 100mph. The airplane circled the airport for about 10 minutes, and then slowed down steadily until it landed 15 minutes later.

Level **:Sketch a graph of the Airplanes speed over time


This part may look different on your graph because problem does not say how long it took to slow down to 100mph.
speed (mph)
1000
900
800
700
600
500
400
300
200
100
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
time (min)

Zombie Apocalypse

The Zombie virus has been unleashed. If at time zero there is only one zombie and the population doubles in size every minute. What function best describes this situation?

Level **:Plot the graph on the Calculator and name Function

Level ***: Come up with the equation of the graph.

Level **:

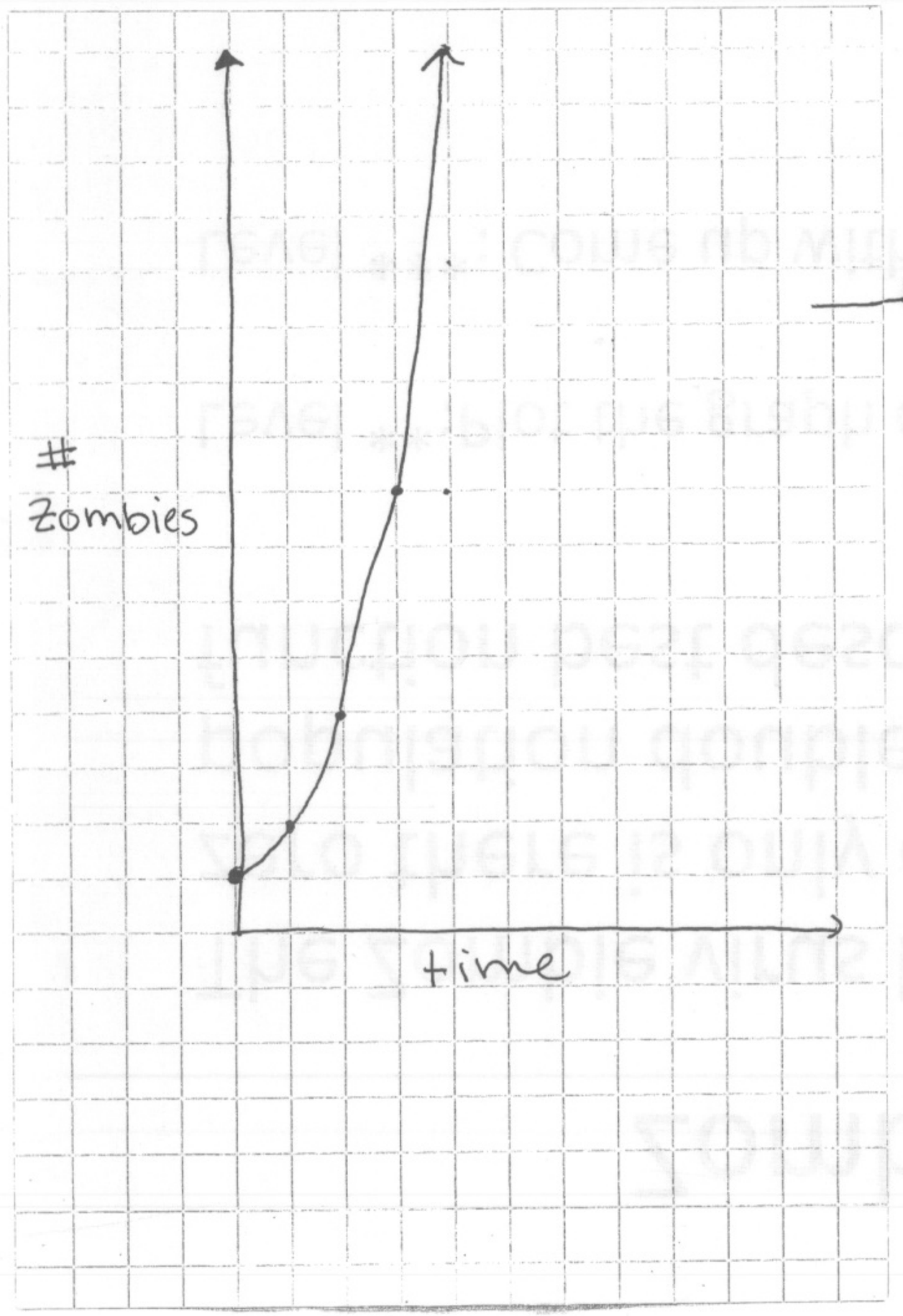
Approach:
- zombies double ea. min
- make table
- maybe graph
- link graph → equation

Plan:

t	# Z
0	1
1	2
2	4
3	8
4	16
5	32
6	64

doubles each time

Graph points



Looking at the graph their are two possible functions it could be Exponential or Quadratic
(means exponent is a variable)

$y=e^x$ or $y=2^x$ or $y=3^x$

$y=x^2$

due to doubles I guess these two

I am going to try points to see what will happen when we plugg-in

Level ***

$y=2^x$

$x=0$	$y=2^0=1$
$x=1$	$y=2^1=2$
$x=2$	$y=2^2=4$
$x=3$	$y=2^3=8$

$y=x^2$

$x=0$	$y=(0)^2=0$
$x=1$	$y=(1)^2=1$
$x=2$	$y=(2)^2=4$
$x=3$	$y=(3)^2=9$

matches best so

Exponential Function