

# 14.1 notes

1.) For each set of data, determine if there is a geometric pattern. If so, find an exponential model.

a.)

x	0	8	16	24
y	7	13	19	25

NOT geometric, Arithmetic

Linear Equation model

$$y = mx + b$$

$$m = \text{slope} = \frac{\Delta y}{\Delta x}$$

$$y = \frac{6}{8}x + 7$$

$$y = 0.75x + 7$$

$$r = 1$$

perfect fit

b.)

x	0	1	2	3
y	2	5	12.5	31.25

Geometric

$$\frac{5}{2} = 2.5 \quad \frac{12.5}{5} = 2.5$$

$$\frac{31.25}{12.5} = 2.5$$

$$r = 2.5$$

ratio

$$y = a(b)^x$$

$$y = 2(2.5)^x$$

$$r = 1$$

perfect fit

2) The cell phone charge decreases exponentially every hour. The table represents the battery percent left over  $t$  hours.

$t$	0	1	2	3	4
pct)	99	74	50	40	28

a) write the exponential regression equation &  $r$ -value.

$$y = a(b)^x \quad y = 99.0(0.730)^x \quad r = -0.998$$

b.) Determine the percent decrease per hour.

$$1 - 0.730 = 0.27 \quad \approx 27\%$$

3.) Given table

$t$	0	1	2	3
$f(t)$	10.5	12.9	14.8	17.1

a.) Find the exponential regression equation &  $r$ -value

$$y = 10.7(1.174)^x \quad r = 0.995$$

b.) Find the percent increase.

$$1.174 - 1 = 0.174 = 17.4\%$$