

1. Determine which table illustrates an exponential function and which one illustrates a linear function. Find formulas for these two functions, then find a formula for the third function.

Table A

x	f(x)
-2	-25.22
0	3.50
2	32.22
4	60.94
6	89.66

differences
are the same

> 28.72

> 28.72

> 28.72

> 28.72

Table B

x	g(x)
0.5	-1
1	0
2	1
4	2
8	3

Table C

x	h(x)
-3	1.3310
-1	1.9167
1	2.7600
3	3.9744
5	5.7231

ratios are
the same

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linear

$$f(x) = 14.36x + 3.50$$

$$m = \frac{28.72}{2} = 14.36$$

$$b = 3.50$$

logarithmic

$$g(x) = \log_2 x$$

exponential

$$h(x) = 2.3(1.2)^x$$

2. Determine which situation is linear and which is exponential. Find a formula for each.

A. A computer purchased for \$3200 loses roughly 20% of its value each year.

exponential

$$V(t) = 3200(0.8)^t$$

t: the number of years since purchase
V(t): the value of the computer

B. A kitchen appliance purchased for \$120 loses roughly \$18 in value every two years.

$$V(t) = 120 - 9t$$

3. It is predicted that the population of a particular state will double by the year 2026. Determine the annual, monthly, and continuous growth rates.

Annual Growth

$$2P_0 = P_0 a^{17}$$

$$2 = a^{17}$$

$$a \approx 1.039$$

The annual growth rate is about 3.9%

Monthly Growth

$$2P_0 = P_0 \left(1 + \frac{r}{12}\right)^{12t}$$

$$2 = \left(1 + \frac{r}{12}\right)^{204}$$

$$1 + \frac{r}{12} \approx$$

$$r \approx$$

The monthly growth rate is about

P_0 : the initial population

Continuous Growth

$$2P_0 = P_0 e^{rt}$$

$$2 = e^{17r}$$

$$\ln 2 = 17r$$

$$r = \frac{\ln 2}{17}$$

$$r \approx$$