Chapter 3 Section 1 MA1032 Data, Functions & Graphs

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Chapter 3 Section 1

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### Percentage Growth

- To increase A by R percent
- Growth Factor
- To decrease A by R percent

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#### Suppose you have a \$500 investment earning a fixed return of 8% per year.

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## **Exponential Functions**

#### Definition

An exponential function Q = f(t) has the formula

$$f(t) = ab^t \qquad b > 0,$$

where *a* is the initial value of Q (at t = 0) and *b*, the base, is the growth factor: b > 1 gives exponential growth, 0 < b < 1 gives exponential decay. The growth factor is given by

$$b = 1 + r$$

where r is the decimal representation of the percent rate of change.

Suppose you have a \$500 investment earning a fixed return of 8% per year. How long will it take for the amount of money to reach \$1000?

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Suppose the population of bacteria is given by the function  $P(t) = 4.3(0.76)^t$  (in millions of bacteria present after t hours). Determine the initial population and the percent decrease per hour.

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### Lines, Parabolas, and Exponentials

What is constant?

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A one-page letter is folded into thirds to go into an envelope. If it were possible to repeat this kind of tri-fold 20 times how many miles thick would the letter be? (A stack of 150 pieces of stationery is one inch thick; 1 mile=5280 feet.)

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# Summary

- Growth factors & growth rates
- ② Decay factors & decay rates
- Section 2 Exponential Functions

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