**7.2 Properties of Exponential Functions  
Objective: To explore the properties of the form**

**To graph exponential functions that have base**

*Note: we will graph in the same way we’ve used parent graphs before.*

*(There is a great chart on bottom of page 444 if you need a review of the transformations.)*

X Y

-2

-1

0

1

2

Example: Graph

X Y Now Plot these points and connect them in a curve.

-2 .75

-1 1.5

0 3

1 6

2 12

h=4 (shift right) and k= -1 (shift down)

Apply the shift to all the points above and state the Domain and Range.

***\*Compound Interest****;*

****

* A = amount after t years
* P = principal deposited
* r = rate (expressed as a decimal)
* n = number of times compounded per year
* t = number of years

*Example*: *You deposit $1000 in an account that pays 8% annual interest. Find the balance after 1 year if the interest is compounded with the given frequency.*

*a) Annually*

*b) Quarterly*

*c) Daily*

**Euler Number**: e, also called the Natural Base e

**The Natural Base e**;

* Is an irrational number (decimal never ends or repeats)
* Derivation: as n approaches +∞, (1 + 1/n)n approaches

**e ≈ 2.718281828459**

**Continuously Compounded Interest**;

*When n approaches +∞, the compound interest formula approximates to;*

**A = Pert**

* A = amount after t years
* P = initial principal deposited
* r = annual rate (expressed as a decimal)
* t = number of years

*Examples:*

*a) You deposit $975 in an account that pays 5.5% interest compounded continuously. What is the balance after 6 years?*

*b) The air pressure P at sea level is about 14.7 pounds per square inch. As the altitude h (in feet above sea level) increases, the air pressure decreases. The relationship between air pressure and altitude can be modeled by:*

*P = 14. 7e-0.00004h*

*Mount Everest in Tibet and Nepal rises to a height of 29,028 feet above sea level. What is the air pressure at the peak of Mount Evere*

*c) The area of a wound decreases exponentially with time. The area A of a wound after t days can be modeled by:*

*A = A0e-0.05t*

*where A0 is the initial wound area. If the initial wound area is 4 square centimeters, how much of the wound area is present after 14 days?*

**Natural Base Exponential Function**:

* Growth: if a > 0 and **r > 0 (positive)**
* Decay: if a > 0 and **r < 0 (negative)**

Obeys the same characteristics and rules as Exponential Functions

**Hmwk: 447 #6-9, 19-27 (odd), 28-31**