

Warm up

Rewrite in decimal form.

1. 2.49×10^5

2. 9.6×10^{-3}

3. 4.00027×10^7

4. $(4 \times 10^{-2}) \cdot (3 \times 10)^2$

Rewrite in scientific notation.

5. 0.006

6. 800,200,000,000

7. 0.0000037

8. $\frac{1.4 \times 10^{-1}}{3.5 \times 10^{-4}}$

p.472 #18-46even
Take out your HW assignment

ADD

p.472 #47-55odd

Homework Questions?

38)

1012.

$$1.012 \times 10^3$$

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

8.6 Exponential Growth Functions

Goals: • Write and graph exponential growth functions.

EQ:

What is the formula for exponential growth?

| | | | |
|---|---|---|------------------------------------|
| Algebra 1.5 Concepts | | ← | → |
| ② LAST UNIT/Experience Systems | ① CURRENT UNIT Exponents & Exponential Functions | ③ | NEXT UNIT/Experience Quadratics |
| ⑧ Student Activities or Assignments | ⑤ UNIT MAP | | |
| 8.1 8.2 8.3 8.4 8.5 8.6 8.7 | | | |
| ⑦ UNIT SELF-TEST QUESTIONS 1. ... properties can be used to simplify & evaluate exponential expressions? 2. What do exponential graphs look like? 3. Can you write numbers in both decimal form and in scientific notation? 4. How can exponential growth and decay equations be used to represent and solve real world problems? | Simplify Graph Apply Represent | | ⑥ UNIT RELATIONSHIPS |

Vocabulary

Exponential growth:

A quantity that is increasing at the same % for each unit of time

Growth rate:

Growth factor:

$y = C(1+r)^t$

Total Balance $\leftarrow y$ C \leftarrow Begin Amt
 $(1+r)$ \leftarrow Rate % \rightarrow Dec. t \leftarrow time

$25\% = .25$ $5\% = .05$
 $.05\% = .0005$

Example 1: Write an Exponential Growth Model

Property Value Growth - The value of \$100,000 house is expected to increase 1% each year over the next fifteen years. Write a model for the expected value of the house during the fifteen years.

$$y = C(1+r)^t \quad \sim 1\% = .01$$

$$= 100000(1+.01)^{15}$$

$$100000(1.01)^{15}$$

$$\approx 116096.8955$$

$$\boxed{\$116096.90}$$

Simple Interest

$$I = PRT$$

$$= 100000(.01) 15$$

$$I = 15000$$

$$\frac{100000}{100000}$$

$$\boxed{\$115000}$$

Example 2: Find the Balance in an Account

Compound Interest - You deposit \$450 in an account that pays 2% interest compounded yearly. What will the account balance be after 10 years?

$$y = c(1+r)^t \leftarrow \text{time}$$

\uparrow Begin $\frac{r}{100} \rightarrow$ Dec

$2\% = .02$

$$y = 450(1+.02)^{10}$$

$$450(1.02)^{10}$$

$$\approx 548.547$$

\$548.55

Try It

1. A company with 60 employees expects a 6% yearly increase in the number of employees. Write an exponential growth model to represent the number of employees E after t years.

$$y = 60(1+.06)^t$$

2) You deposit \$375 in an account that pays 3% interest compounded yearly. What is the account balance after 8 years?

$$y = 375(1 + .03)^8$$

$$\approx 475.03878$$

$$\text{\$}475.04$$

Example 3: Use an Exponential Growth Model

Population Growth - An initial population of 80 rabbits doubles each year for four years. What is the rabbit population after four years?

$$y = 80(2)^4$$

$$y = 1280 \text{ Rabbits}$$

8.6 p.480 #16-34even, 37-39 (Show set-up)

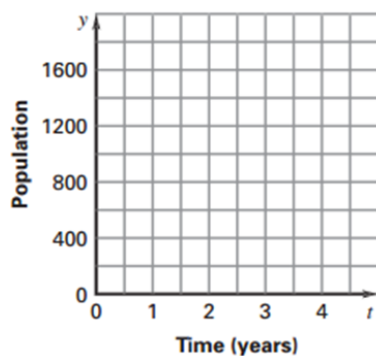
Example 4: A Model with a Large Growth Rate

Graph the exponential growth model in Example 3.

The growth model from Example 3 is $y = __ (__)^t$.

Make a table of values, plot the points in a coordinate plane, and draw a smooth curve through the points.

| t | 0 | 1 | 2 | 3 | 4 |
|-----|-------|-------|-------|-------|-------|
| y | _____ | _____ | _____ | _____ | _____ |



Summary

EQ:

8.6 Homework