Algebra 2 w/ Trig

4.2 Graph Exponential Decay Functions

Warm-Up:

**Evaluate the expression without using a calculator.**

1. $\left(\frac{1}{3}\right)^{-3}$ 2. $–\left(\frac{2}{5}\right)^{0}$ 3. $4\left(\frac{2}{3}\right)^{-2}+1$

4. **A savings account pays** 3% **interest compounded monthly. What is the growth factor for this account?**

**-------------------------------------------------------------------NOTES------------------------------------------------------------------------------------**

Example 1: Graph $y=b^{x}$for 0 < *b* < 1 Example 2: Graph $y=a∙b^{x}$for 0 < *b* < 1

Graph $y=\left(\frac{1}{2}\right)^{x}$. Graph $y=2\left(\frac{1}{4}\right)^{x}$.



YOU TRY:

1. Graph $y=\left(\frac{2}{3}\right)^{x}$ 2. Graph $y=-2\left(\frac{3}{4}\right)^{x}$



Example 3: Graph $y=a∙b^{x-h}+k$for 0 < *b* < 1 Example 4: Solve a multi-step problem

**A new snowmobile costs** $4200**. The value of the snowmobile decreases by** 10% **each year.**

**Write an exponential decay model giving the snowmobile’s value *y* (in dollars) after *t* years. Estimate the value after** 3 **years.**

**Use the graph to estimate when the value of the snowmobile will be** $2500**.**



Graph $y=3\left(\frac{1}{2}\right)^{x+1}-2$

YOU TRY:

Graph the function. State the domain and range.

3. $y=\left(\frac{1}{4}\right)^{x-1}+1$ 4. $y=5\left(\frac{2}{3}\right)^{x+1}-2$ 5. $g\left(x\right)=-3\left(\frac{3}{4}\right)^{x-5}+4$



**6. The value of a snowmobile has been decreasing by** 7% **each year since it was new. After** 3 **years, the value is** $3000**. Find the original cost of the snowmobile.**

KEEP GOING:

Graph the following, state the domain and range.

1. $y=4\left(\frac{1}{2}\right)^{x}$ 2. $y=3\left(\frac{1}{4}\right)^{x+2}+2$



**3. A new laptop computer costs** $1500**. The value of the computer decreases by** 22% **each other.**

**a. Estimate the value of the computer after** 2 **years.**

**b.** **Estimate when the computer will be worth** $550**.**

Hw: Section 4.2 p. 239 #1-23 odds, 27, 31, 33