

**HOMEWORK:** *Exponential Functions*

1. Determine whether the following equations represent exponential growth or decay. Find the percent increase or decrease.

<p>a. <math>y = 72(1.6)^x</math></p>	<p>b. <math>y = 24(0.8)^x</math></p>	<p>c. <math>y = 3\left(\frac{6}{5}\right)^x</math></p>	<p>d. <math>y = 7\left(\frac{2}{3}\right)^x</math></p>
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<p>2. A new car that sells for \$18,000 depreciates 12% per year. Write a function that models the value of the truck.</p> <p>Find the value of the truck after 4 years.</p>	<p>3. A bear population increases at a rate of 2% per year. The initial population was 1573 bears. Write a function that models the bear population.</p> <p>How many bears will there be in 10 years?</p>	<p>4. Five years ago you invested money in an account with 2.5% interest compounded continuously. The account now has \$3000. How much money did you originally invest?</p>
<p>5. Suppose you invest \$5000 at an annual interest rate of 6.9% for 20 years.</p> <p>a. How much would be in the account if interest was compounded quarterly?</p> <p>b. How much would be in the account if interest was compounded monthly?</p> <p>c. How much would be in the account if interest was compounded continuously?</p>	<p>6. How long will it take you to triple your investment at an annual interest rate of 4.25% compounded daily? <i>(You will need your graphing calculator...)</i></p> <p>b. How long would it take if the same investment was compounded continuously?</p>	

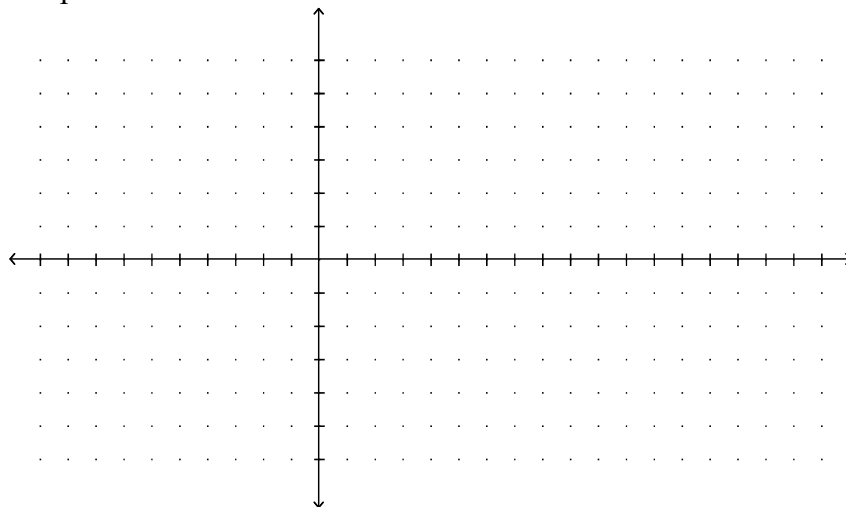
7. **VERIFY** the following trig identities. **Remember:** You can only work on one side of the equation!!

a.  $\cos \theta = \sec \theta - \sin \theta \tan \theta$

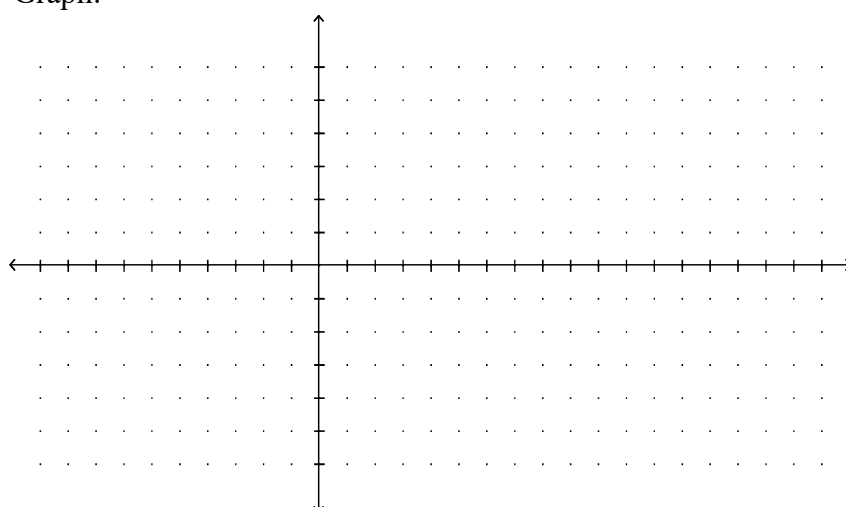
b.  $\sin^2 \theta = \cos \theta (\sec \theta - \cos \theta)$

8. Given:  $\sin \theta = \frac{-5}{7}$  and  $\pi \leq \theta \leq \frac{3\pi}{2}$ , find the other 5 trig ratios.

9. Graph  $y = -5\sin\left(\frac{2}{3}\left(\theta + \frac{\pi}{4}\right)\right)$

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	$\theta$	$y$																									

10. Graph  $y = \tan\left(\frac{1}{3}\left(\theta + \frac{3\pi}{2}\right)\right) + 4$

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**11.** Write an exponential equation that passes through the points  $(1, 4)$  and  $(4, 864)$

**12.** Solve the following trig functions for  $0 \leq \theta < 2\pi$ .

**a.**  $2 \cos^2 \theta - 1 = 0$

**12b.**  $\tan^2 \theta - \sqrt{3} \tan \theta = 0$

**12c.**  $4 \sin^2 \theta - 4 \sin \theta = -1$

**12d.**  $\sin \theta \tan \theta = 0$