Exponential Station #3

$A = P\left(1+\frac{r}{n}\right)^{nt}$

1. If a student deposits $1500 in the bank and earns an annual interest rate of 8% how much will he have after 15 years?

$A = 1500\left(1+\frac{.08}{1}\right)^{1 \cdot 15}$

$A = \$4758.25$

2. Kelly plans to put her graduation money into an account and leave it there for 4 years while she goes to college. She receives $900 in graduation money that she puts into an account earning 4.25% interest quarterly. How much will be in Kelly's account at the end of four years?

4 times per year

$A = 900\left(1+\frac{.0425}{4}\right)^{4 \cdot 4}$

$A = \$1065.81$ or $A = \$1065.82$

3. A girl drops a ball from a height of 10 feet. Each time the ball hits the ground, it bounces to 2/3 its previous height. What equation gives y, the height of the ball after x bounces? What is the height after the fifth bounce? $x=5$

$y = 10\left(\frac{2}{3}\right)^{x}$

$10\left(\frac{2}{3}\right)^{5}$

$y = 1.32$ ft

4. What is the smallest positive integer for x, so that the value of f(x) = 200(2)^x is greater than the value of g(x) = 500x + 400.

Graph both and find intersection when gets above other

intersection at $x = 3.39$

So smallest integer would be $x=4$ or use table

5. Jenna cut a piece of cloth several times. The table below shows the number of pieces of cloth she had after making several cuts.

	Cuts	1	2	3	4	5	6
y	Pieces of Cloth	2	4	8	16	32	64

x

$\cdot 2 \quad \cdot 2 \quad \cdot 2$

Which equation could be used to determine the number of pieces of cloth, *y*, Jenna had after making *x* cuts?

$r=2 \quad f(1)=2$ | $r=2 \quad f(0)=1$

$f(n) = 2 \cdot 2^{n-1}$ or | $f(n) = 1 \cdot 2^{n}$

6. A business had a profit of $32,000 in 1990 that increased by 15.5% per year.

a) Write the equation to model the situation. $A = 32000\left(1+\frac{.155}{1}\right)^t$

b) Find the profit of the company after 3 years? $49,305.56 c) In 1998? $101,345.83

Plug in 3 Plug in 8

7. You buy a used car for $10,200. The value of the car depreciates at a yearly rate of 7%.

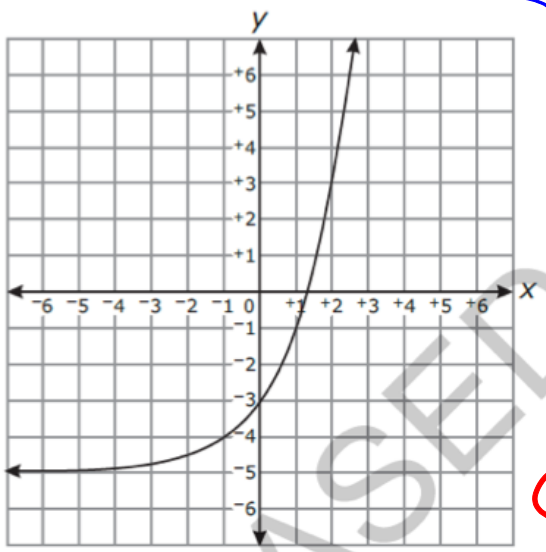
a) Write the equation to model the situation. $10,200(1-0.07)^t$

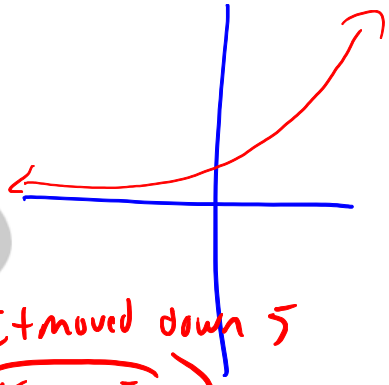
b) Find the value of the car after 4 years? $7630.13 c) After 6 months? $9836.52

Plug in 4 Plug in 1/2

8. The function $f(x) = 2(2)^x$ was replaced with $f(x) + k$, resulting in the function graphed below.

Compare graphs





It moved down 5

$k = -5$

What is the value of k?

9. The population of Winnemucca, Nevada, can be modeled by $P = 6191(1.04)^t$ where t is the number of years since 1990. What was the population in 1990? By what percent did the population increase by each year?

Plug in 0 ⇒ 6191

1.04 means 4% increase

10. The population of a town grows exponentially each year. Currently the population is 2,000, and it has continued to grow at a rate of 6% each year. What is the common ratio?

$2000(1+.06)^t$

$r = 1 + .06$

$r = 1.06$

53/50