

6.2 Simple & Compound Interest
Homework

Name: _____

Date: _____ Block: _____

Formulas		
Simple Interest	Compound Interest	Half - Life
$I = Prt$	$A = P \left(1 + \frac{r}{n}\right)^{nt}$ $y = a \left(1 + \frac{r}{n}\right)^{nt}$	$A = P(0.5)^t$ $y = a(0.5)^t$

1. Josh deposited \$250 in his bank account that pays 3% simple interest. In one year, how much interest will Josh earn? What will your account balance be after 1 years?

$$I = Prt$$

$$I = 250(.03)(1)$$

$$I = \$7.50$$

Balance
\$257.50

2. Find the amount of money accumulated if Anne put \$1200 in an account offering 5% interest compounded annually for 5 years.

$$n=1$$

$$y = 1200 \left(1 + \frac{.05}{1}\right)^{5(1)}$$

$$y = 1200(1.05)^5$$

$$y = \$1531.54$$

3. Find the amount of money accumulated if Mike put \$1650 in an account offering 5.5% interest compounded quarterly for 3 years.

$$n=4$$

$$y = 1650 \left(1 + \frac{.055}{4}\right)^{3(4)}$$

$$y = 1650(1.01375)^{12}$$

$$y = \$1943.81$$

4. Find the amount of money that John would need to invest in a savings account now if he wants the balance to be \$15,000 in 8 years. The account compounds interest monthly with an annual interest rate of 6%.

$$15000 = P \left(1 + \frac{.06}{12}\right)^{12(8)}$$

$$15000 = P(1.005)^{96}$$

$$\frac{15000}{\text{ans}} = \frac{P(\text{ans})}{\text{ans}}$$

$$P = \$9292.86$$

*only round final answer

*answer will be greater if you rounded earlier

5. The half-life of isotope X is 2 years. If you start with a 4 gram sample, how many grams will remain after 8 years?

$$t = \frac{8}{2} = 4$$

$$y = 4(.5)^4$$

$$y = 0.25 \text{ grams}$$

Radioactive material will decay over time. A certain radioactive material will decay according to the following formula: $A = 200(0.80)^t$ where 200 grams is the initial amount and each year the material decays 20% (this is why $.80 = 80\%$ is what remains each year). A is the amount left after t years.

6. Using the above formula, find after 4 years, how much would 200 grams decay to?

$$A = 200(.80)^4$$

$$A = 81.92 \text{ grams}$$

decay problem

$$y = a(1-r)^t$$

$$y = 200(1-.2)^t$$

$$y = 200(.80)^t$$

given $\star A = 200(.80)^t$

Exponential Growth $y = a(1+r)^x$	Exponential Decay $y = a(1-r)^x$
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7. You have inherited land that was purchased for \$30,000 in 1960. The value of the land ^{growth} increased by approximately 5% per year. What is the appropriate value of the land in the year 2011?

$$y = 30000(1+.05)^{51}$$

$$y = \$361,223.09$$

$$\begin{array}{r} 2011 \\ - 1960 \\ \hline 51 \text{ years} \end{array}$$

8. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by a set rate. After 5 hours, there is only 72 mg of ibuprofen left in the body. What is the rate of depreciation?
decay

$$72 = 400(1-r)^5$$

$$.18 = (1-r)^5$$

$$\sqrt[5]{.18} \approx r$$

$$29\%$$