$A=P\left(\frac{1}{2}\right)^{\frac{t}{h}}$
$A=P(2)^{\frac{t}{h}}$
$A=P(1\pm r)^{\frac{t}{h}}$

A = after amount
P = initial amount
t = time (that's passing)
h = half life or time it takes for the percent to be applied

Name Schlansky
Mr. Schlansky

Date _____
Algebra II

Irregular Time (Half Life)

1. The half-life of mendelevium-258 is 51.5 days. To the *nearest hundredth of a gram*, how much of a 4000 gram mendelevium-258 sample will remain after 12 days?

A = A
P = 4000
t = 12
h = 51.5

$A=P\left(\frac{1}{2}\right)^{\frac{t}{h}}$
$A=4000\left(\frac{1}{2}\right)^{\frac{12}{51.5}}$
$A=3403.43$

2. The amount of ants in a colony doubles every 8 days. If there are initially 275 ants, how many ants, to the nearest ant, will be in the colony after 30 days?

A = A
P = 275
t = 30
h = 8

$A=P(2)^{\frac{t}{h}}$
$A=275(2)^{\frac{30}{8}}$
$A=3700$

3. Phil is trying to get himself back into shape and wants to ease his way back into distance running. He will start by running 2 miles each day but every four days, he will increase his distance by 60%. How many miles will Phil be running after 10 days rounded to the *nearest tenth of a mile*?

A = A
P = 2
t = 10
h = 4
r = .6

$A=P(1\pm r)^{\frac{t}{h}}$
$A=2(1+.6)^{\frac{10}{4}}$
$A=6.5$

4. Jay borrowed $50,000 from Aaron and they came to an agreement regarding how the interest will be paid. Every 5 days, the loan will accumulate 2% interest. If Jay repays the loan after 21 days, how much money will he have to repay Aaron rounded to the *nearest cent*?

A = A
P = 50,000
r = .02
t = 21
h = 5

$A=P(1\pm r)^{\frac{t}{h}}$
$A=50,000(1+.02)^{\frac{21}{5}}$
$A=54,336.38$

5. The half life of an element is 27 hours. If there were initially 4.2 kg of the substance, how much will remain after 2 days? Round your answer to the *nearest hundredth* of a kg.

A = A
P = 4.2
t = 48
h = 27

48 hours

$A = P\left(\frac{1}{2}\right)^{\frac{t}{h}}$

$A = 4.2\left(\frac{1}{2}\right)^{\frac{48}{27}}$

$A = 1.22$

6. Jabba went to the movies on Friday night and bought a large popcorn. Every 20 minutes, Jabba eats 40% of the remaining amount of popcorn in his bucket. If there were 967 pieces of popcorn initially in Jabba's bucket, how many pieces of popcorn, to the *nearest piece of popcorn*, will be left an hour and a half into the movie?

decreasing

A = A
P = 967
r = .4
t = 90
h = 20

90 minutes

$A = P(1 \pm r)^{\frac{t}{h}}$

$A = 967(1 - .4)^{\frac{90}{20}}$

$A = 97$

7. The amount of views of a YouTube video triples every 5 days. If it currently has 1120 views, how many full views will the video have two weeks from now?

A = A
P = 1120
t = 14
h = 5

14 days

$A = P(3)^{\frac{t}{h}}$

$A = 1120(3)^{\frac{14}{5}}$

$A = 24274.90$

$A = 24275$

8. A payday loan company makes loans between \$100 and \$1000 available to customers. Every 14 days, customers are charged 30% interest with compounding. In 2013, Remi took out a \$300 payday loan. Which expression can be used to calculate the amount she would owe, in dollars, after one year if she did not make payments?

365 days

1) $300(.30)^{\frac{14}{365}}$ 2) $300(1.30)^{\frac{14}{365}}$ 3) $300(.30)^{\frac{365}{14}}$ 4) $300(1.30)^{\frac{365}{14}}$

A = A
P = 300
r = .3
t = 365
h = 14

$A = P(1 \pm r)^{\frac{t}{h}}$

$A = 300(1 + .3)^{\frac{365}{14}}$