| Name | Schl | aust | <u> </u> |
|--------|---------|------|----------|
| Mr. Sc | hlansky | | |

| Date | |
|------------|--|
| Algebra II | |

Exponential Modeling Finding P and t

1. Melanie's car is currently worth \$22,000. She bought it 3 years ago and the depreciate rate is compounded continuously at 7%. What was the initial value of the car?

$$A = 22.000$$
 $P = P$
 $A = Pert$
 $F = -07$
 $A = Pert$
 $e^{-.07(3)}$
 $e^{-.07(3)}$
 $e^{-.07(3)}$

2. Megan's savings account currently has \$5,125 in it. If the account was opened 4 years ago and has an interest rate of 4.3% compounded weekly, how much money was initially put into the

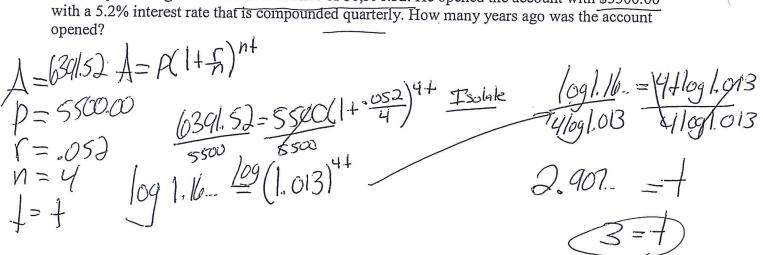
has an interest rate of 4.3% compounded weekly, now much account?

$$A = 5125$$
 $P = P$
 $F = .043$
 $A = 5125 = P(1 + \frac{0.43}{52})$
 $A = 5125 = P(1 + \frac{0.43}{52})$

3. If the current balance of a bank account is \$4,321 and the account was opened 3 years ago with an interest rate of 3% compounded continuously, what was the initial amount of the account?

$$\frac{A = Pe^{rt}}{4321 = Pe^{-0.3(3)}}$$

$$e^{-0.3(3)}$$



4. Manny's savings account has a balance of \$6,391.52. He opened the account with \$5500.00

5. If a bank account was opened with \$3000 and interest is compounded continuously at 5.2%, how much time has passed if there is now \$4000 in the account?

$$A = 4000$$
 $A = De^{rt}$
 $P = 3000$
 $V = .052$
 V

6. Danielle currently has \$2125 in her savings account. If she opened the account with \$1700 and the account has an interest rate of 4.1% that is compounded continuously, how long has the account been open?

$$A = 2125$$

$$A = 1200$$

7. Mike's bank account has tripled since he opened the account. If he opened the account with \$1000 and interest is compounded monthly at a rate of 8.1%, how much time, to the nearest year, has the account been open?

$$A = 3(100) A = P(1+1)$$

$$D = 1000 3000$$

$$0 = 1000 \qquad \frac{3000 = 1000 (1 + \frac{081}{12})}{1000 + 000}$$

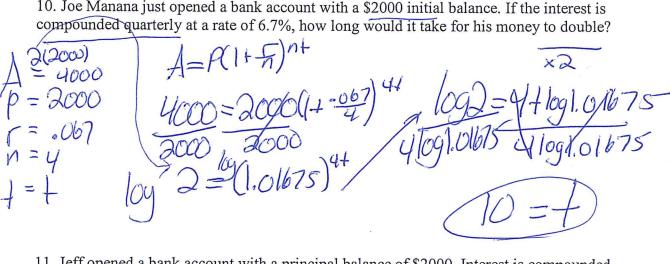
$$N = 12$$
 $\log 3 = 91.00675^{12+}$

$$A = 3(100)$$
 $A = P(1+\frac{\pi}{n})^{n+}$
 $A = 12$
 $A = 12$
 $A = 12$
 $A = 13.60$
 $A = 13.60$

8. The amount of money in Jennifer's bank account has increased by 25% since she opened it. The initial investment was \$4800. If the interest is compounded continuously at a rate of 5.8%, how much time, to the nearest tenth of a year, has passed since the account has been opened?

9. The value of a \$24000 car depreciates at a rate of 11% per year annually. After how many years will the car be worth 30% of its original value? Round your answer to the nearest year.

$$\frac{1200 = 24000 (1-.11)}{24000} + \frac{1200}{24000}$$



11. Jeff opened a bank account with a principal balance of \$2000. Interest is compounded monthly at a rate of 1.4%. After how many years, to the nearest tenth of a year, will it take for

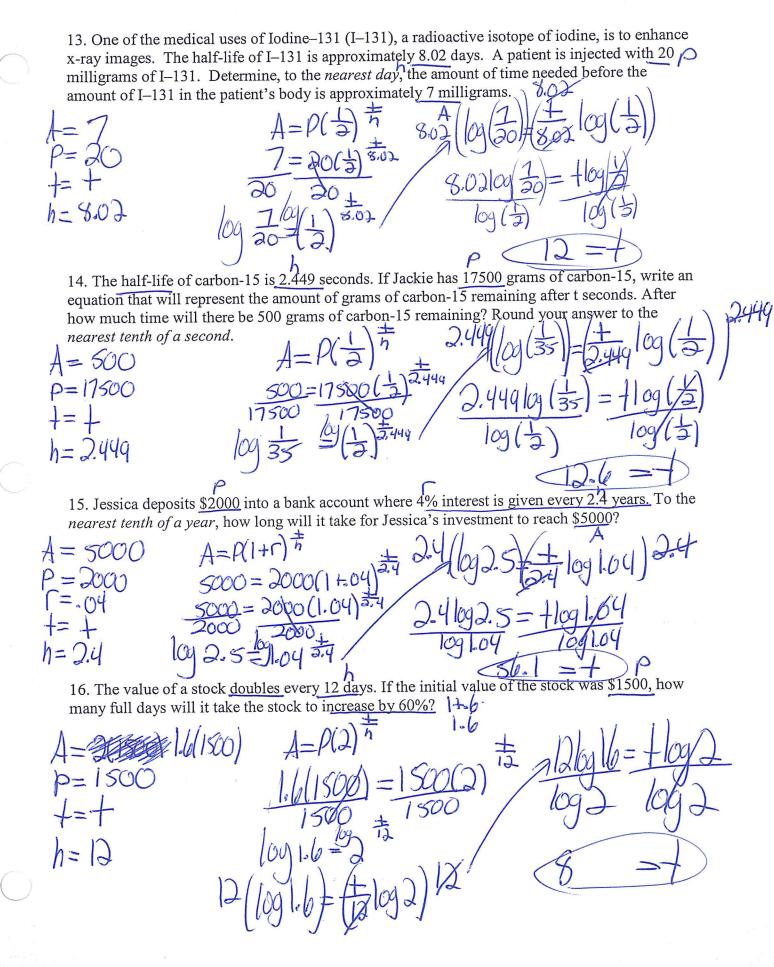
1.5(
$$\frac{1}{2000}$$
)

 $A = 3000$
 $A = p(1+f_1)^{n+}$
 $A = 100$
 A

12. Seth's parents gave him \$5000 to invest for his 16th birthday. He is considering two investment options. Option \overline{A} will pay him 4.5% interest compounded annually. Option B will pay him 4.6% compounded quarterly. Algebraically determine, to the *nearest tenth of a year*, how long it would take for option B to double Seth's initial investment.

ally determine, to the nearest tenth of a year,

with's initial investment. $\frac{B}{A = P(1 + F)} = \frac{10000}{1 + 046}$ $A = \frac{5000}{1 + 046} = \frac{1}{4}$ $A = \frac{10000}{1 + 046}$ $A = \frac{10000}{1 +$



17. Christopher and Nolan are both preparing for the Nassau County Spelling Bee. There are a total of 5000 words that they are responsible for knowing how to spell. Currently, Christopher knows 1200 words and Nolan knows 1000 words. Every 4 days, Christopher will learn 20% of the remaining words. Every 6 days, Nolan will learn 25% of the remaining words. Create two functions to represent how many words Christopher and Nolan will be able to spell after d days. After how many days will they be able to spell the same number of words rounded

to the nearest day. $A = \rho(1+r) \frac{1}{h}$

Christopher

$$A = A$$
 $A = 1200(1+.2)^{\frac{1}{4}}$
 $A = A$
 $A = 1200(1+.25)^{\frac{1}{4}}$
 $A = A$
 $A = A$
 $A = 1200(1+.25)^{\frac{1}{4}}$
 $A = A$
 $A = A$
 $A = 1200(1+.25)^{\frac{1}{4}}$
 $A = A$
 $A = 1200(1+.25)^{\frac{1}{4}}$
 $A = A$
 $A = A$

18. A radioactive substance has a mass of 140 g at 3 p.m. and 100 g at 8 p.m. Write an equation $\frac{1}{4}$

in the form $A = A_0 \left(\frac{1}{2}\right)^{\frac{1}{k}}$ that models this situation, where h is the constant representing the

number of hours in the half-life, A_0 is the initial mass, and A is the mass t hours after 3 p.m. Using this equation, solve for h, to the nearest ten thousandth Determine when the mass of the radioactive substance will be 40 g. Round your answer to the nearest tenth of an hour.