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- b) Your APY for this account.
3. Imagine you are the proud parent of a newborn baby girl. You have decided to start a college fund for her through your local bank, which offers an account with quarterly compounding and an APR of 4%. How much must you invest in this account today in order to have \$120,000 in 18 years?
4. Instead of investing in the account above, you have opted to save your money by making semiannual payments of \$300 into a savings plan which has an APR of 3.2%. If you continue to make your payments for the next 18 years, how much money will you have in your savings plan?
5. If the sales of novelty new years glasses rose by 15% in 2009 but fell by 70% in 2010, by what percent did sales rise or fall over the two year period?

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6. The distance from the Earth to the Sun is about 150 million kilometers. The diameter of the Sun is about 1.4 million kilometers and the diameter of the Earth is about 12,760 kilometers. You decide to build a scale model of the Sun and the Earth. If you use a racquetball ball (with a 2.25-inch diameter) for the Sun, how large will the model of the Earth be and how far away will it be from the racquetball ball? (Hint: 1 cm is 0.3937 inches.)
7. The population of Salt Lake City in 1870 was 12,854, in 1890 the population was 44,843. Assuming the population of Salt Lake City grows in an exponential fashion, find when the population will reach 300,000.
8. 47 people went shopping for fruit. 16 bought apples, 17 purchased plums and 10 bought oranges. In particular, 2 bought all three fruits, 6 purchased apples and plums only, 4 bought apples and oranges only, and 9 just bought plums.
- a) How many people didn't buy any fruit?
- b) How many people purchased only oranges?

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9. If I scale the radius of a circle by a factor of 2, how is the diameter scaled and how is the area scaled?
10. Say you bought an old Soviet nuclear warhead on the black market that uses Plutonium-239 as fission material; how long will it take for there to be a quarter of the fission material left. (Plutonium-239 has a half-life of 24100 years)
11. Suppose gasoline sells for 1.65 euros/liter in Paris, France. What is the price in U.S. dollars? (1 gallon = 3.785 liters and assume 1 US dollar = .72 euros)
12. The final cost of your new shoes was \$70.13. The local sales tax rate is 5.9%. What was the retail price of your shoes before tax?
13. Suppose that 54% of the students at a university are male. If there are a 1000 male students at the university. How many female students are there?

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14. Suppose there are 30 students in this class. If 80% of the students are registered, how many are not registered?
15. Suppose that you went to a restaurant for dinner and left \$75. If your bill including taxes was \$62.40, compute the tip rate for the meal?
16. Urban encroachment causes the loss of 7% of the area of the rainforest each year.
- (a) Write down an exponential model for the area of rainforest at a given time.
- (b) Determine the how long it will take until 10% of the rainforest remains.

| | Time | Snow Depth(inches) |
|-----|--------|--------------------|
| 17. | 1:00PM | 8 |
| | 2:00PM | 11 |
| | 3:00PM | 14 |
| | 4:00PM | 17 |
| | 5:00PM | 20 |

(a) Determine whether this is linear or exponential growth.

(b) Write down a model based on (a).