

The following are not annuities.

1. Lisa invested \$3000 in a mutual fund account that earns 8% per year, compounded annually.

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| a) Determine how much she'll have at the end of 5 years. | b) Determine how long it will take her money to double. (Work backwards) Round to the nearest tenth. | c) Determine how long it will take her money to triple. Round to the nearest tenth. |
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2. Russell won \$45,000 on a lotto card and invested it in a CD that earns 2% per year, compounded annually.

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| a) Determine how much he'll have at the end of 10 years. | b) Work backwards to determine how long it will take his money to double. Round to the nearest tenth. | c) Determine how long it will take his money to triple. Round to the nearest tenth. |
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3. Simplify:                    a)  $72/8 =$  \_\_\_\_\_                    b)  $72/2 =$  \_\_\_\_\_

c) Compare those answers to what you found in 1b and 2b. What did you notice?

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| d) If Sheri invested some cash at a rate of 6%, predict how long it will take her investment to double. | e) Choose some Principal amount and see if you're right about Sheri. Show your work: |
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There's something in investing called "The Rule of 72". Write down what you think it is:

The Rule of 72 states that you can estimate the amount of time (#of periods) it takes an investment to double by dividing 72 by the interest rate. An investment made at 7.2% will double in approximately ten years:  $72 / 7.2 = 10$ . An investment made at 0.5% per month will double in approximately 144 months:  $72 / 0.5 = 144$ . (Note that this is used for estimates. It works when there's no calculator around (gasp!))



f) How long will it take an investment made at 4% annual interest to double?

g) How long will it take an investment made at 36% annual interest, compounded monthly, to double? (Answer in months.)

4. Now try this: a)  $\frac{\ln 2}{\ln 1.08} = \underline{\hspace{2cm}}$

b)  $\frac{\ln 2}{\ln 1.02} = \underline{\hspace{2cm}}$

c) Compare those answers to what you found in 1b and 2b. What did you notice?

d) So if you had an investment that grew at 5.2% annually, how long will it take the investment to double?

5. Try this: a)  $\frac{\ln 3}{\ln 1.08} = \underline{\hspace{2cm}}$

b)  $\frac{\ln 3}{\ln 1.02} = \underline{\hspace{2cm}}$

c) Compare those answers to what you found in 1c and 2c. What did you notice?

d) So if you had an investment that grew at 4.1% annually, how long will it take the investment to triple?

6. Try this: a)  $\frac{\ln 1.5}{\ln 1.08} = \underline{\hspace{2cm}}$

b)  $\frac{\ln 1.5}{\ln 1.02} = \underline{\hspace{2cm}}$

c) What do you think those numbers mean?

d) So if you had an investment that grew at 4.7% annually, how long will it take the investment to grow by 50%?

The Bottom Line

7. Summarize two ways of predicting how many periods it will take an investment to double. Use an example of your own to prove it.

8. Summarize one way to predict how many periods it will take an investment to triple. Use an example of your own to prove it.