

Compound Interest

Imagine that your Gramma gives you \$100 for your birthday in December. You decide to research different ways to start a savings plan that will help you make the most of your gift. You find a savings plan that pays 8% interest annually.

| | Piggy Bank | Simple Interest (Compounded Annually) | Compounded Semi-Annually | Compounded Quarterly |
|-------------------------|-------------------|--|-------------------------------------|---------------------------------|
| Balance on 1/1 | | | | |
| Balance on 4/1 | | | | |
| Balance on 7/1 | | | | |
| Balance on 10/1 | | | | |
| Balance on 12/31 | | | | |

Compound Interest Formula

Using the formula above, fill out the table below to show how much money would be in your account at the end of 20 years if your account pays 5% per year and is compounded as shown in the table.

| Compounded Annually | Compounded Semi-Annually | Compounded Quarterly | Compounded Monthly | Compounded Daily |
|--------------------------------|-------------------------------------|---------------------------------|-------------------------------|-------------------------|
| | | | | |

Natural Base

Consider an investment of \$1 in an account that pays 100% annual interest. Write a formula for the amount in the account after 1 year for n compounding per year.

Find the value of the account for the number of compounding per year that are given in the table below.

| Number of Compoundings Per Year (n) | Value in Account after 1 Year |
|---|-------------------------------|
| 1 | |
| 10 | |
| 100 | |
| 1000 | |
| 10,000 | |
| 100,000 | |
| 1,000,000 | |

| |
|------------------------------------|
| Natural Base e |
|------------------------------------|

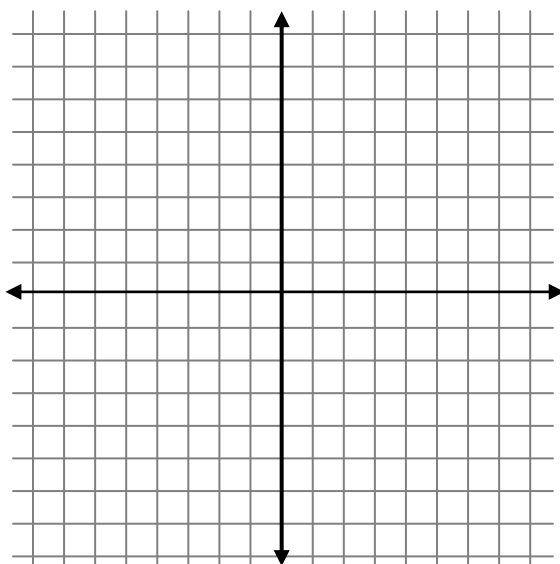
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|---|
| Compounding Continuously Formula |
|---|

Compare the amount of money in two savings accounts after 25 years with the same initial investment of \$500 and interest rate of 6% if the first account is compounded monthly and the second is compounded continuously.

| Compounded Monthly | Compounded Continuously |
|--------------------|-------------------------|
| | |

Graphing $f(x) = e^x$

| x | $f(x) = e^x$ |
|-----|--------------|
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |



List 3 features of the graph that are the same as other exponential graphs (with different bases).

Compound Interest Worksheet

1. Find the amount of money in an account after 15 years if \$7000 is deposited at 6% annual interest compounded as follows.

| Annually | Semi-Annually | Quarterly | Daily | Continuously |
|----------|---------------|-----------|-------|--------------|
| | | | | |

2. How much money will be in an account at the end of 34 years if \$17,000 is deposited at 12% annual interest compounded as follows?

| Annually | Semi-Annually | Quarterly | Daily | Continuously |
|----------|---------------|-----------|-------|--------------|
| | | | | |

3. Fill in the table for each of the given functions. Then graph each function on the same axes.

a)

| | |
|----|--------------|
| x | $f(x) = 2^x$ |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

b)

| | |
|----|--------------|
| x | $g(x) = 4^x$ |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

c)

| | |
|----|--------------|
| x | $h(x) = e^x$ |
| -2 | |
| -1 | |
| 0 | |
| 1 | |
| 2 | |

