Calculating Doubling Time

You are to start with $100.00 in the bank at 10% compounded annually. Calculate how long it will take for you to reach $200.00. This is known as the Doubling Time. Use Table 1 below

|  |  |  |  |
| --- | --- | --- | --- |
| Time | Capital | Amount of Interest | Amount at end of year |
| Start of Year 1 | $100 at 10% | $10.00 | $110 |
| Start of Year 2 | $110 at 10% | $11 | 121 |
| Start of Year 3 | 121 at 10% |  |  |
|  |   |  |  |
|  |   |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Now recalculate the Doubling Time with 5% interest in Table 2

|  |  |  |  |
| --- | --- | --- | --- |
| Time | Capital | Amount of Interest | Amount at end of year |
| Start of Year 1 | $100 at 5% | $5.00 | $105 |
| Start of Year 2 | $105 at 5% |  |  |
| Start of Year 3 |   |  |  |
|  |   |  |  |
|  |   |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Can you determine a mathematical patter (formula) that would allow you to calculate the doubling time for any growth rate?

Using your formula to find the time it would take a country to double its population if it had the following growth rate.

Country Growth Rate % Doubling Time (year)

X 2

Y 4

Z 1

|  |  |  |  |
| --- | --- | --- | --- |
| Time | Capital | Amount of Interest | Amount at end of year |
| Start of Year 1 | $100 at 10% | $10.00 | $110 |
| Start of Year 2 | $110 at 10% | $11 | 121 |
| Start of Year 3 | 121 at 10% | 12.1 | 133.1 |
| Start of Year 4 |  131.1 | 13.31 | 146.41 |
| Start of Year 5 |  146.41 | 14.164 | 161.05 |
| Start of Year 6 | 161.05 | 16.11 | 177.16 |
| Start of Year 7 | 177.16 | 17.72 | 194.88 |
| Start of Year 8 | 194.88 | 19.49 | 214.37 |

|  |  |  |  |
| --- | --- | --- | --- |
| Time | Capital | Amount of Interest | Amount at end of year |
| Start of Year 1 | $100 at 5% | $5.00 | $105 |
| Start of Year 2 | $105 at 5% | 5.25 | 110.25 |
| Start of Year 3 |  110.25 | 5.51 | 115.76 |
| Start of Year 4 |  115.76 | 5.79 | 121.55 |
| Start of Year 5 |  121.55 | 6.08 | 127.63 |
| Start of Year 6 | 127.63 | 6.38 | 134.01 |
| Start of Year 7 | 134.01 | 6.70 | 140.71 |
| Start of Year 8 | 140.71 | 7.03 | 147.74 |
|  | 147.74 | 7.39 | 155.13 |
|  | 155.13 | 7.76 | 162.89 |
|  | 162.89 | 8.14 | 171.03 |
|  | 171.03 | 8.55 | 179.58 |
|  | 179.58 | 8.98 | 188.56 |
|  | 188.56 | 9.43 | 197.98 |

Consider the rule of 72

72/2 = 36 years

72/4 = 18 years

72/1 = 72 years