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11.1 IB Math SL

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Two Methods of Calculation: Application to Interest Rates

This paper compares two methods of calculating interest on a loan. The first is analytically, using an exponential formula and hand-held calculator. The second is to build up the cash flows period by period using spreadsheet technology. [Explain how writing this paper will both develop your understanding of exponential functions, and the use of technology and technical writing.] The paragraphs below set out the problem situation, explain the algebraic/calculator method, and, then show the spreadsheet calculation. Finally, I conclude with a brief comparison of the calculations.

**Interest rate parameters roughly in line with college loans**

The parameters of the interest rate calculation are set out below. The values are round numbers to simplify the discussion. [Explain clearly the inputs, perhaps using a table or list: r=6%, t=10 years, P=$10,000. Compound the interest annually, or as a challenge, you may compound monthly. You may also show both compounding alternatives and compare them.]

**Analytic solution using an exponential formula and calculator**

This section presents the calculation in the way it would be typically performed in school or on a test, using algebraic notation (“working” in IB terminology) and a hand-held calculator. [Introduce the formula and parameters (refer to the values above). Write down the steps with an appropriate amount of detail, center the equations and use formal mathematical notation. Close with a brief summarizing statement or introduction to the next section.]

**Cash flow details calculated with a spreadsheet**

Spreadsheets are powerful tools commonly used in industry and science. The interest rate calculation is performed in Excel, as discussed in this section. [Clearly explain the spreadsheet method, especially the display of each year’s interest amount and accumulating principal amount in rows. Explain each column. Include an image of the Excel sheet.]



Figure 1 Spreadsheet calculation of interest (Microsoft Excel)

**Discussion and comparison of results**

[Summarize the results, compare the methods in a paragraph or two and conclude the paper.]

Use this for your table. It’s neat and in MLA format. In your text, refer to it as “(see table 1)” or “(see fig. 1).”

Table 1

SAT and income for select colleges

|  |  |  |
| --- | --- | --- |
| School | SAT (25th percentile) | Median mid-career salary |
| Adelphi | 1480 | 86,400 |
| Stony Brook | 1660 | 90,900 |
| Fairfield | 1710 | 99,500 |
| Rutgers | 1710 | 91,800 |
| Fordham | 1830 | 90,300 |
| NYU | 1940 | 88,500 |
| Columbia | 2100 | 105,000 |
| Princeton | 2110 | 130,000 |
| Mean | 1818 | 97,800 |

Source: Mike McClenathan, “How Much Is A High SAT Worth? Up To $100K In Future Earnings.” Forbes, Forbes Magazine, 12 June 2012.

Figure 1

Scatter plot of SAT scores versus median mid-career salaries (6 colleges and the mean)

Works Cited

Buchanan, Laurie, et al. *IB Diploma Programme: Mathematics Standard Level*. New York: Oxford, 2012.