VCE General Mathematics Unit 3

Sample learning activity: Recursion and financial modelling

Introduction

This task explores the use of technology to obtain tabular and graphical representations of first-order linear recurrence relations where  $: u\_{0}=a, u\_{n+1}=Ru\_{n}+d$

Part 1

In the following activity consider the first ten terms of the recurrence relation.

1. Let R=1. $: u\_{0}=a, u\_{n+1}=Ru\_{n}+d$Produce tables of values and graphs for various relations corresponding to different combinations of values of *a* and *d*.
2. Describe key features of the tables and graphs and explain how these are related to the values of *a* and *d*.
3. Let d=1. Produce tables of values and graphs for various relations corresponding to different combinations of values of *a* and *R*.
4. Describe key features of the tables and graphs and explain how these are related to the values of *a* and *R*.
5. Explain how a constant sequence could be produced and illustrate this with several examples.

Part 2

In the following activity consider the first ten terms of the recurrence relation.

1. Produce tables of values and graphs for various relations corresponding to different combinations of values of *a*, $R\ne 0$ and *d*.
2. Describe key features of the tables and graphs and explain how these are related to the values of *a*, *R* and *d*.

Areas of study

The following content from the areas of study is addressed through this task.

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| **Unit 3** |
| **Area of study** | **Topic** | **Content dot point** |
| Discrete mathematics | Depreciation of assets | 1 |

Outcomes

The following outcomes, key knowledge and key skills are addressed through this task.

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| **Unit 3** |
| **Outcome** | **Key knowledge dot point** | **Key skills dot point** |
| 1 | 1 | 1 |
| 2 | 1, 2 | 2 |
| 3 | 1, 2, 3, 4, 5, 6, 7 | 1, 2, 3, 4, 5, 6, 7, 9, 10 |