

### Finding a relationship to describe growth/decay patterns in observed data.

#### Task 1

A woman buys a luxury car for HKD500 000. Over time, its re-sale value gradually drops, according to:

Time elapsed (full years)	Re-sale value (HKD)
0	500 000
1	420 000
2	365 000
3	300 000
4	263 000
5	220 000
6	185 000

Your task is to find a mathematical equation that describes (with reasonable accuracy) the data above.

Use a simple analytical method (i.e. only use technology to verify your answer) to arrive at the model.

#### (a) Questions to test how successful we were

- What was the value of the car 2.5 years after the woman bought it?
- What was the value of the car 4 years and 3 months after the woman bought it?
- How long after buying the car does its value drop to HKD150 000?

#### (b) Other questions

- How reliable do you think your model is?
- How accurate are your answers?

#### Task 2

"Banana" computers brings out an incredible new computer that receives wonderful reviews in the press. Demand for the model is extremely high, and the sales figures for the first 8 months of the year, for the *Banana World* store look like this:

Month	Jan	Feb	Mar	April	May	Jun	July	Aug
Units sold (in thousands)	0.85	1.1	1.5	2.1	2.4	3.8	5.1	7

- Develop an equation that describes the way the sales figures grow each month. **Show your method clearly.**
- How could you **justify** your equation?
- Use the equation to predict what the December sales figures will be
- Do you think the equation will always work – for several years to come, for example?