EML3041 Example for Chapter 02.03 Numerical Differentiation of Discrete Functions

An aircraft position *x*, during an emergency landing exercise on a runway is timed as follows

<i>t</i> , <i>s</i>	0	5	10	17.5	25
<i>x, m</i>	200	800	1100	1200	1250

- a) Estimate the velocity of the aircraft at 17.5 seconds using a finite difference formula.
- b) Estimate the acceleration of the aircraft at 17.5 seconds using a finite difference formulas.
- c) Use the last three data points using direct interpolation method, answer the following questions?
 - a. At what time does the aircraft come to rest?
 - b. What is the location of the aircraft at the time it comes to rest?
 - c. What is the velocity of the aircraft at the time it comes to rest?
 - d. What is the acceleration of the aircraft at the time it comes to rest?