

3 (a) Pectin is a polysaccharide found in plant cell walls. Pectinase is an enzyme that hydrolyses pectin.

A student investigated the use of pectinase to extract more juice from different types of fruit.

The student:

- removed the outer skin and cut each type of fruit into small pieces
- placed each type of fruit into a separate beaker with 5 cm³ of 1% pectinase solution
- incubated the mixture at 60 °C for 10 minutes
- passed the contents of the beaker through a filter funnel into a measuring cylinder
- measured the volume of juice extracted from each type of fruit.

Table 3.1 shows the results.

Table 3.1

type of fruit	volume of juice extracted / cm ³			
	sample 1	sample 2	sample 3	mean of samples
apple	16	17	17
orange	30	37	33
pineapple	41	44	45
grapes	17	15	11

(i) Complete Table 3.1 by calculating the means. [1]

(ii) The independent variable is the type of fruit and the dependent variable is the volume of juice extracted.

Complete Table 3.2 to show the type of variable and the type of data.

Table 3.2

	type of variable	type of data
type of fruit		
volume of juice extracted		

[2]

(iii) State **two** changes the student should make to their method to improve the quality of their results.

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..... [2]

(b) The student wanted to determine the quantity of pectin in the cell walls of different types of fruit.

Suggest why the student could **not** use the experiment in 3(a) to determine the quantity of pectin in the cell walls of different types of fruit.

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..... [2]