

Question 10**(12 marks)**

A survey in Western Australia was conducted on the popularity of a calculator known as Type A. Out of 1450 Year 12 students, the survey found that 986 students used the Type A calculator.

Determine the following.

- (a) A 90% confidence interval, to three decimal places, for the proportion of Western Australian Year 12 students who use the Type A calculator. What assumption was made in calculating this interval? (3 marks)
- (b) The margin of error in this confidence interval. (2 marks)

Another three surveys of Year 12 students were conducted on the use of Type A calculators across Australia.

Survey 2	Survey 3	Survey 4
Type A usage 1772 out of 3221 Year 12 students	Type A usage 1021 out of 1566 Year 12 students	Type A usage 2203 out of 3221 Year 12 students

- (c) Determine which of these surveys were more likely to have been taken outside of Western Australia. Justify your answer(s). (3 marks)

- (d) Using the sample proportion of the survey at the start of the question, determine a sample size that will halve the margin of error for the proportion of Western Australian Year 12 students who use the Type A calculator, with a confidence of 90%. (4 marks)