

MATHEMATICS TEST

Year 9 – Part C2

This part of the test contains one major problem, which you have 45 minutes to solve.

It is very important that you clearly show how you have solved the problem.

At the start of each problem you will find a square with a description regarding what your teacher will take into account when assessing your work.

All calculations and answers should be written on paper that is handed in at the end of the test. The test packet must be handed in with your solutions.

You may use calculator and ruler.

Name: _____

School: _____ Class: _____

Date of birth: Year _____ Month _____

Day _____

Girl ☐ Boy ☐

Part C2 – Icosahedron

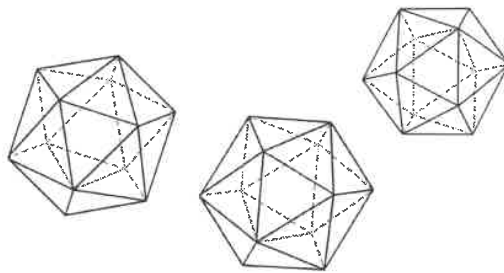
At the assessment of your work the teacher will take into account

- what mathematical knowledge you have shown
- how well you have reported your work and performed your calculations
- how well you have argued for your conclusions.

An icosahedron is bounded by twenty equilateral triangles. One can use it as a twenty-sided die.

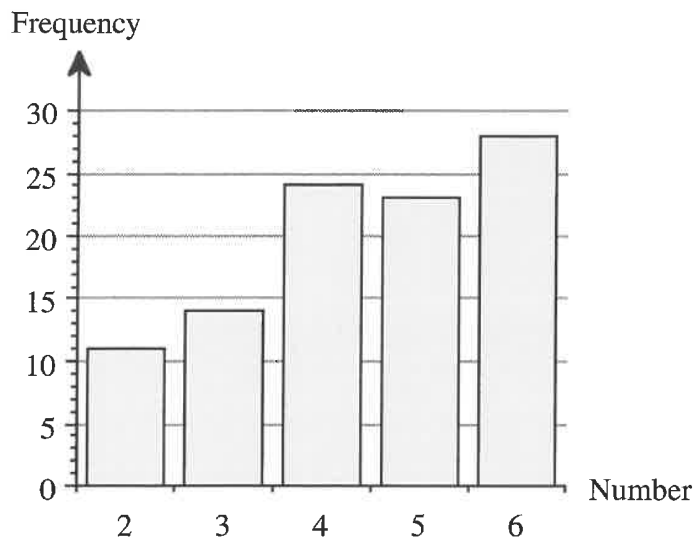
A certain 20-sided die has:

- 2 faces with a number 2
- 3 faces with a number 3
- 4 faces with a number 4
- 5 faces with a number 5
- 6 faces with a number 6



- a) Find the probability to get a 2 and find the probability to get a 6 when you toss the twenty-sided die.

Eva tossed the twenty-sided die 100 times. For every toss she noted the number that came up. Then she grouped the result in a diagram that you see on the next page.



Study the diagram.

- b) Is it reasonable that it became double as many sixes as threes?
- c) Is the result of Eva's investigation what can be expected?
- d) Find the mean and the median for Eva's 100 tosses.

Do not forget to report your thinking and your calculations and to motivate your conclusions.

Eva and Adam use the twenty-sided die for a game. They buy three big bags with caramels, take one bag each and let the third bag be "bank". They toss the die every second time and use the following rules:

If you hit a 6 you may take *five* caramels from the bank. If you hit a 2, 3, 4 or 5 you pay *one* caramel to the bank.

- e) How will the game probably end if they go on until any one of the caramel-bags is empty?