

7. Probability

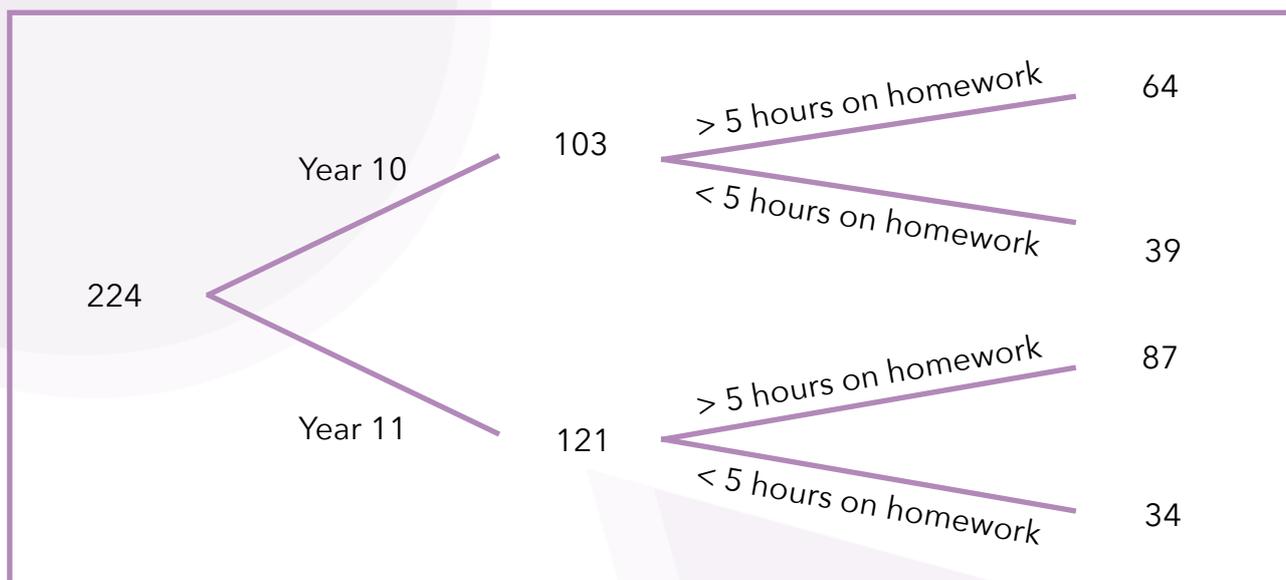
Analysing school survey results

You are a member of your school council. At the end of last term you shared a survey with the students at your school to learn more about the school population and what the student council should focus on for the rest of the year. You are responsible for analysing the results from Years 10 and 11.

Task one: Frequency trees

224 students responded to the survey, 103 of whom were from Year 10. In Year 10, 64 students said that they spent more than five hours a week doing homework whereas 87 students in Year 11 said the same.

1. Complete the below frequency tree showing these survey results.



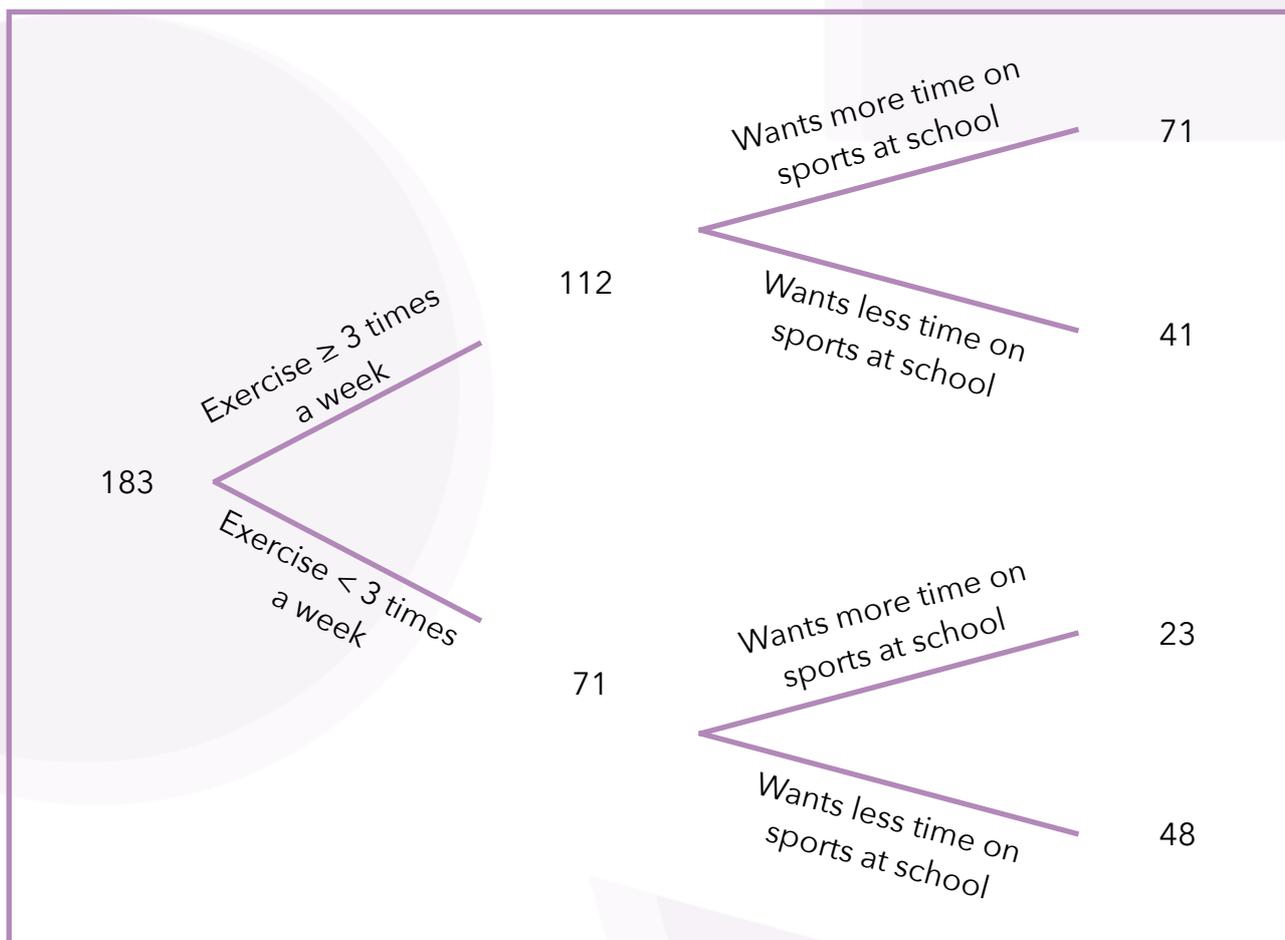
2. Find the probability that a student selected randomly completes more than five hours a week of homework.

$$(87 + 64) / 224 = 0.67 = 67\%$$

In a later section of the survey, students are asked optional questions about their wellbeing.

In total, 183 students completed this section of the form. 112 students said that they exercised at least three times a week on average. Of the group that exercised less than three times a week, 23 of them stated that they would like more time to do sports at school, 71 of the other group felt the same.

3. Complete the below frequency tree to show these survey results.



4. Find the probability that a student selected randomly would like more time for sports at school.

$$(71 + 23) / 183 = 0.51 = 51\%$$

Task two: Frequency tables

When asked which subject they spent the most time studying for, students responded with the following.

Most studied subject	Maths	History	French	Science
Year 10	38	26	15	24
Year 11	34	34	22	31

1. Given that a student chosen randomly is in Year 10, what is the probability that they spend the most time studying Science?

$$38 + 26 + 15 + 24 = 103$$
$$24 / 103 = 0.23 = 23\%$$

2. Given that a student chosen randomly studies History the most, what is the probability that they are in Year 11?

$$34 / (26 + 34) = 0.57 = 57\%$$

You are interested in setting up study skills sessions for GCSE pupils but you are not sure when these sessions should take place. A nearby school has introduced compulsory study skills sessions but students can choose between three different options.

	Lunchtime session	After school session	Online learning
Number of attendees	14	6	20

3. What is the probability that students opt for online learning?

$$20 / (14 + 6 + 20) = 0.5 = 50\%$$

4. What is the probability that students will opt for a lunchtime study skills session?

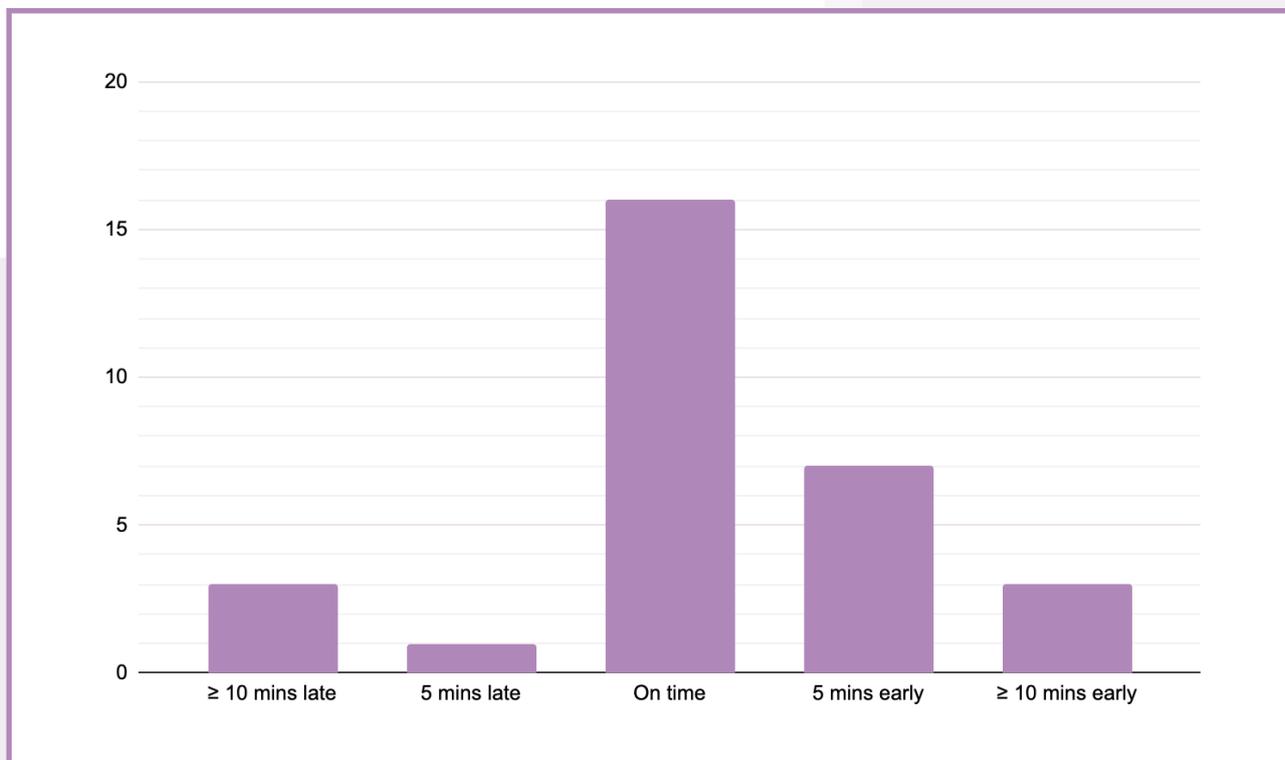
$$14 / 40 = 0.35 = 35\%$$

5. Given there are 280 students across Year 10 and Year 11, how many students do you expect to attend the after school sessions?

$$\begin{aligned} 6 / 40 &= 0.15 = 15\% \\ 0.15 \times 280 &= 42 \end{aligned}$$

Task three: Frequency graphs

The below frequency graph shows how often Mike was late for school in the last 30 days.



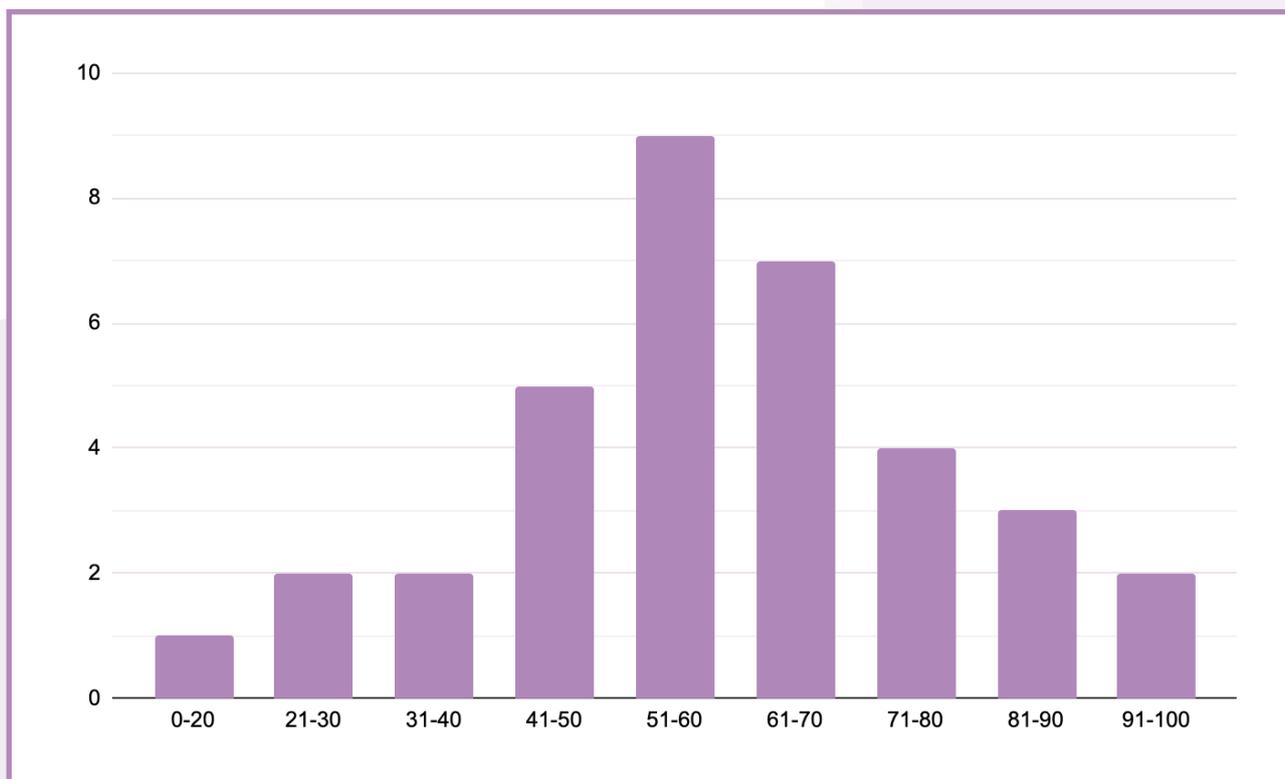
1. What is the probability that Mike will be on time tomorrow?

$$16 / 30 = 0.53 = 53\%$$

2. What is the probability that Mike will be 10 or more minutes late for school tomorrow?

$$3 / 30 = 0.1 = 10\%$$

The below frequency graph shows class results from the recent probability test.



3. What is the probability that students scored between 51% and 70%?

$$(9 + 7) / (1 + 2 + 2 + 5 + 9 + 7 + 4 + 3 + 2) = 16/35 = 0.46 = 46\%$$

4. What is the probability that students scored above the mode average?

Mode = 51-60

$$\text{Students who scored above the mode average} = (7 + 4 + 3 + 2) / 35 = 0.46 = 46\%$$