BRADLEY'S MATHS

GCSE Higher Tier Mathematics

Frequency Trees

FREE SAMPLE WORKSHEET 4
Includes Full Model Answers

William Bradley

Retired Head Teacher & Mathematics Specialist

*This resource is part of the **Complete Worksheet Collection**, meticulously crafted to align with AQA, Edexcel, OCR, and WJEC specifications. It builds understanding from fundamental principles to complex, Grade 9 examination-style problems.*

The Complete Collection

Every worksheet. Every model answer sheet.
The complete library covering every single aspect of GCSE Mathematics.

Number, Ratio & Proportion (33 Sets)	£15
Algebra & Graphs (46 Sets)	£20
Geometry & Measures (36 Sets)	£15
Probability & Statistics (19 Sets)	£10
Total Value if bought separately	**£60**

Designed to facilitate a full teaching and learning experience, taking the student from **Core Skills**, through **Applied Reasoning**, to the final **Grade 9 Discriminators**.

4 Books. 134 Worksheets. 134 Model Answers.

Packed with hints, tips, insights, cautions and reminders to ensure students get the best opportunity to reach their full potential.

Purchase the **Full Bundle** today...

Get all four books (The entire GCSE course)

for the 25% discounted price of just

£45

Available now at:

bradleysmaths.co.uk

Instructions

- Answer all questions in the spaces provided.
- For ”Construct” questions, use a ruler to draw your branches.
- Ensure your numbers are integers (counts), not probabilities.
- Check that your branches add up to the total at each split.

Key Concepts: Frequency Trees

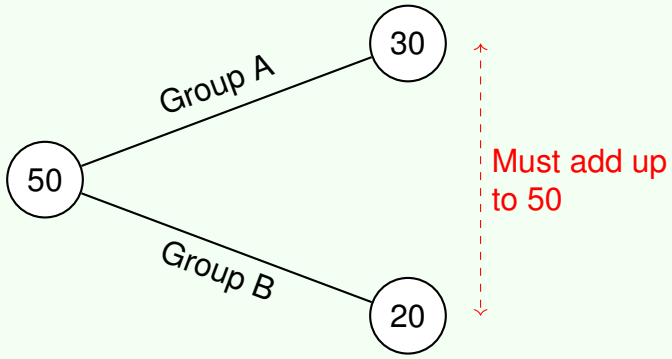
Deeper Insight: Frequency vs. Probability Trees

Do not confuse Frequency Trees with Probability Trees.

- **Frequency Trees** show the actual **number** of items (integers) in each category. The branches sum to the total count.
- **Probability Trees** show the **fraction or decimal** chance of an event. The branches sum to 1.

Method: The Summing Rule

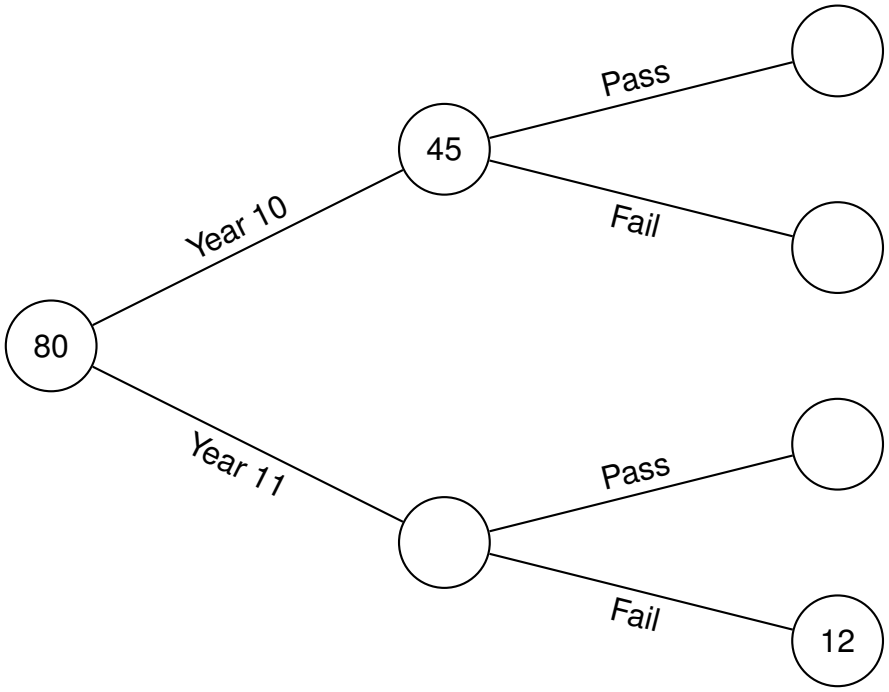
A Frequency Tree flows from Left to Right. The number in a ”Parent” bubble must equal the sum of the numbers in its ”Child” bubbles.



---

1. 80 students sat a test. There are 45 students in Year 10. The rest are in Year 11.
   - In Year 10, 28 students passed the test.
   - In Year 11, 12 students failed the test.

   (a) Complete the frequency tree. [3]

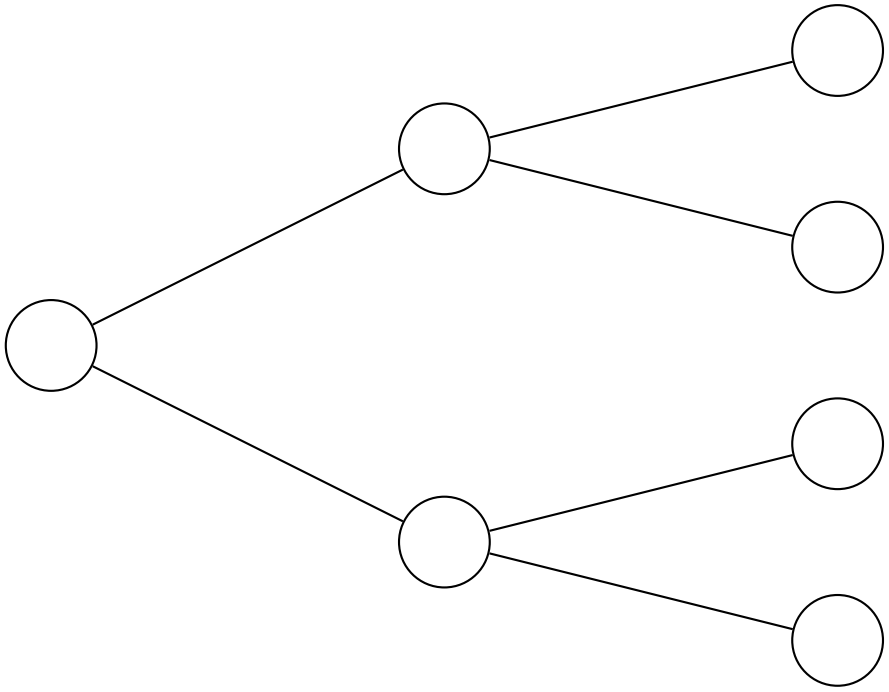


   (b) A student is chosen at random. Find the probability that they passed the test. [2]

---

2. 120 people went to a cinema.
   - 60% of the people were Adults. The rest were Children.
   - $\frac{1}{4}$ of the Adults bought popcorn.
   - 40 Children bought popcorn.

   (a) Construct a frequency tree to show this information. [3]



(b) What fraction of the people bought popcorn? [2]

3. There are 200 beads in a bag. The beads are either Red or Blue. The ratio of Red beads to Blue beads is $3 : 2$.

   Of the Red beads, 20% are circular. The rest are square. Of the Blue beads, $\frac{3}{10}$ are circular. The rest are square.

   (a) Complete a frequency tree to represent this information. [3]

   (b) Calculate the total number of square beads. [2]

4. A tennis club has 80 members. The members are Men or Women.

   30 members played in a tournament. The rest did not play.

   12 Men played in the tournament. 45 Women did not play in the tournament.

   Use a frequency tree to find the total number of Men in the club. [4]

This is the end of the worksheet

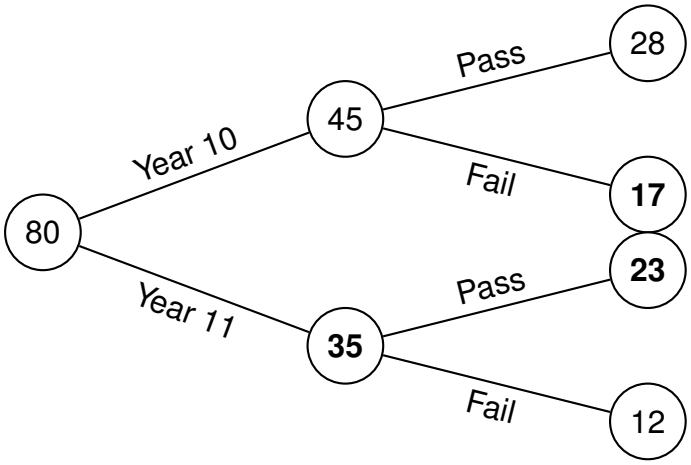
Worked Solutions

1)

Check: The Summing Rule

At every branch split, check your addition. $45 + 35 = 80$ ✓ $28 + 17 = 45$ ✓ $23 + 12 = 35$ ✓

(a) **Completed Frequency Tree:**

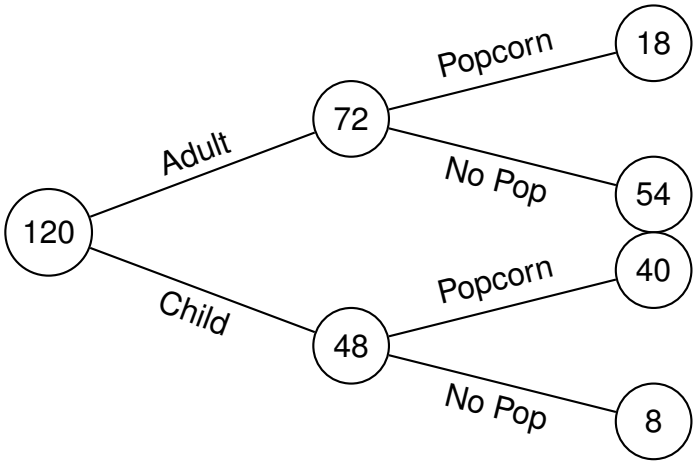


(b) **Probability of Passing:** Total students who passed = 28 (Year 10)$+23$ (Year 11) $=$ 51.

$$P(\text{Pass}) = \frac{\mathbf{51}}{\mathbf{80}}$$

2) (a) **Calculations:**

- Adults: 60% of $120 = 0.6 \times 120 = 72$.
- Children: $120 - 72 = 48$.
- Adults (Popcorn): $\frac{1}{4}$ of $72 = 18$.
- Adults (No Popcorn): $72 - 18 = 54$.
- Children (Popcorn): 40 (Given).
- Children (No Popcorn): $48 - 40 = 8$.



(b) **Fraction buying popcorn:** Total Popcorn = $18 + 40 = 58$.

$$\frac{58}{120} = \frac{\mathbf{29}}{\mathbf{60}}$$

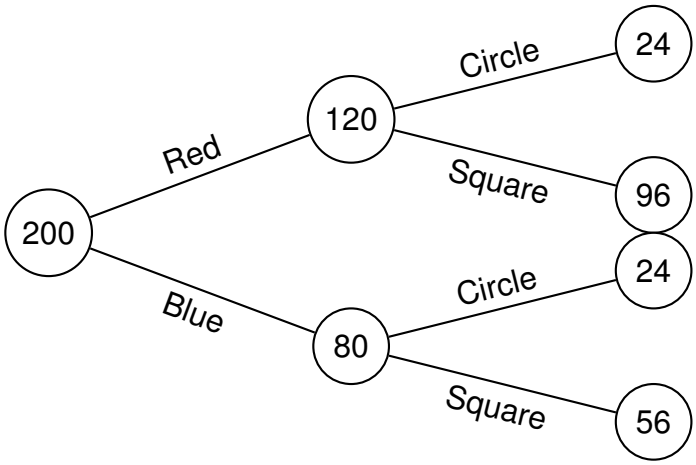
---

3) Ratios and Percentages:

Method: Handling Ratios

Ratio Red : Blue is $3 : 2$. Total parts = $3 + 2 = 5$. Value of one part = $200 \div 5 = 40$. Red = $3 \times 40 = 120$. Blue = $2 \times 40 = 80$.

(a) **Completed Tree:**



(b) **Total Square Beads:** Red Square (96) + Blue Square (56) = **152 beads**.

4) Finding the Unknowns:

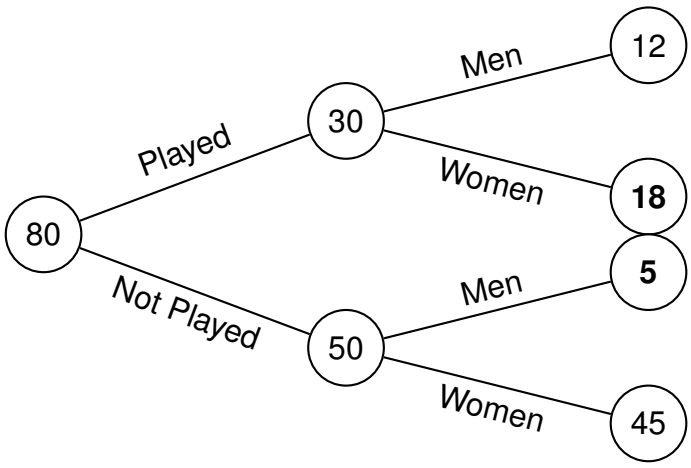
Method: Working Backwards

Fill in what you know first.

- Total = 80.
- First split: Played (30) / Not Played (50).
- Men Played = 12. Women Not Played = 45.

Then deduce the missing numbers.

Option A: Splitting by Activity First

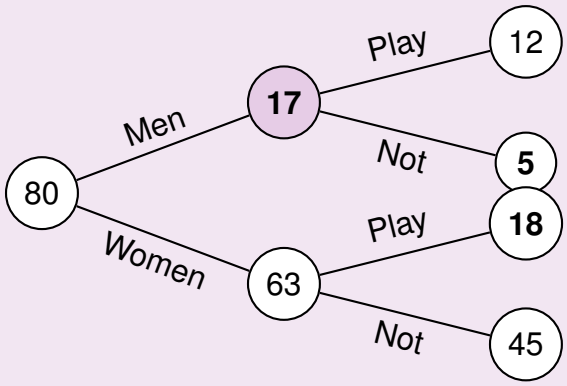


Logic Steps:

- **Women who Played:** Total Played (30) - Men Played (12) = **18**.
- **Men who did not Play:** Total Not Played (50) - Women Not Played (45) = **5**.
- **Total Men:** Men Played (12) + Men Not Played (5) = **17**.

Deeper Insight: Choosing the Order

You could also have split the tree by **Gender first** (Men/Women) and then by Activity. The diagram looks different, but the logic and the answer remain exactly the same.



Here, we found the end numbers first:

- Women who Played = Total Played (30) - Men Played (12) = 18.
- Men Not Played = Total Not Played (50) - Women Not Played (45) = 5.
- Total Men = $12 + 5 = 17$.

Answer: There are **17** Men in the club.