3.19 Frequency Trees: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 65 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

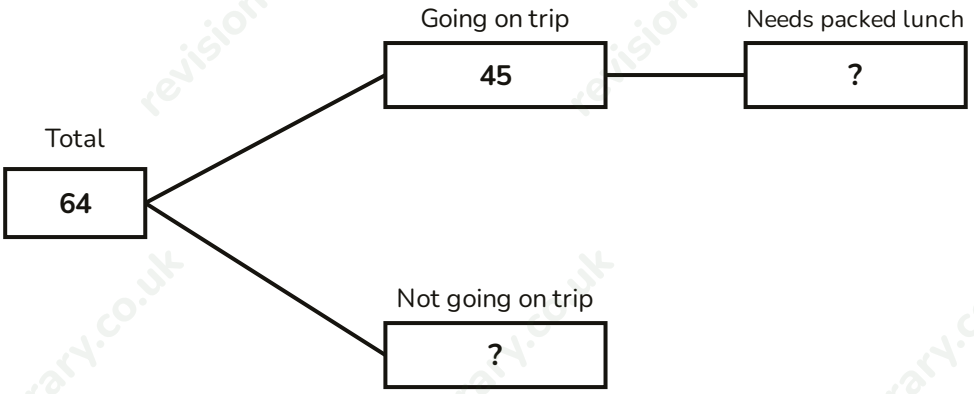
Answer ALL questions. Show all your working.

1 A school club has 60 pupils. 40 are in the drama group and 20 are not. A frequency tree starts with two branches: Drama and Not drama.
Write down the frequencies for the two branches at the first level of the tree.

(Total for Question 1 is 1 mark)

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2 64 students were asked whether they are going on the school trip. 45 of them said yes.



(a) Complete the frequency tree by working out the number of students who are not going on the trip. **(1)**

(b) Of the students going on the trip, 3 in every 5 need a packed lunch from school. Work out how many students need a packed lunch. **(2)**

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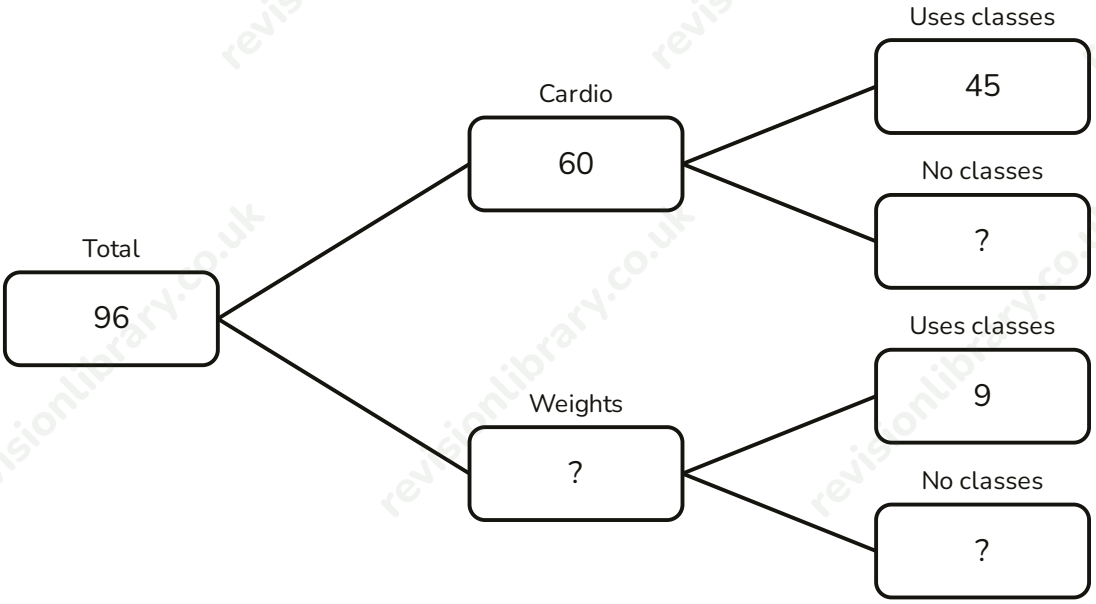
(c) Each packed lunch costs £3.50. Work out the total cost of all the packed lunches needed. **(2)**

.....

(Total for Question 2 is 5 marks)

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3 96 gym members were asked whether they prefer cardio or weights, and whether they use classes. 60 members prefer cardio, of whom 45 use classes. Of the members who prefer weights, 9 use classes.



(a) Write the number of cardio members who use classes as a fraction of all cardio members. Give your answer in its simplest form. **(2)**

(b) Work out the total number of members (cardio and weights) who use classes. **(1)**

.....

(c) Work out the probability that a randomly chosen member prefers weights and does not use classes. Give your answer as a fraction in its simplest form. **(2)**

.....

(Total for Question 3 is 5 marks)

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4 There are 360 members in a club. 2/3 of the members are male.
1/4 of the males and 1/4 of the females are left-handed.
Work out the number of female members who are not left-handed.

(Total for Question 4 is 3 marks)

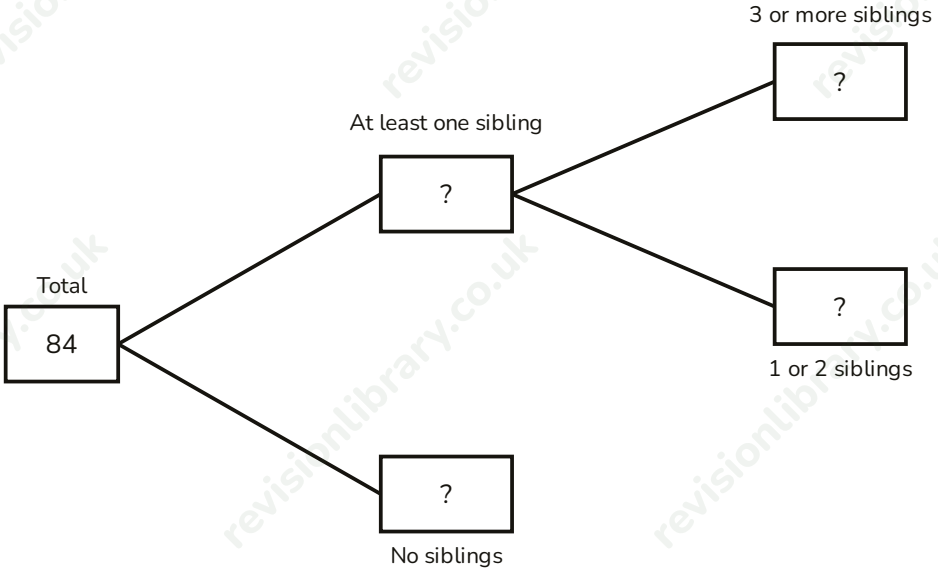
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5 A leisure centre has 120 members. 60 of them are adults and the rest are children.
60% of the adults and half of the children have a season ticket.
How many of the members do not have a season ticket?

(Total for Question 5 is 4 marks)

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6 A youth club has 84 members. 3/4 of the members have at least one sibling.



(a) Show that the number of members with at least one sibling is 63. **(2)**

(b) Hence work out the number of members with no siblings. **(1)**

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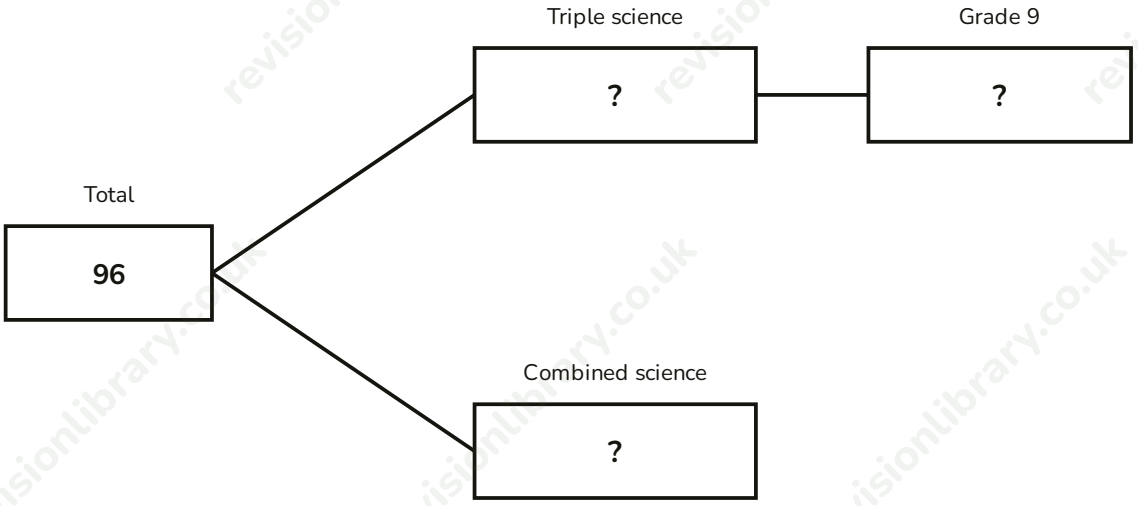
(c) Of the members with at least one sibling, 2/9 have 3 or more siblings. Work out the number of members who have 3 or more siblings. **(2)**

.....

(Total for Question 6 is 5 marks)

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7 There are 96 students in Year 11. They study triple science or combined science in the ratio 5 : 3.



(a) Work out the number of students who study triple science. **(2)**

.....

(b) Work out the number of students who study combined science. **(1)**

.....

(c) Of the triple science students, 1/4 achieved a grade 9. Work out the number of triple science students who achieved a grade 9. **(2)**

.....

(Total for Question 7 is 5 marks)

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8 A student has started a frequency tree to show whether 80 pupils have school dinners or a packed lunch, and whether they are vegetarian. The tree states: Total = 80; School dinners = 45, of which Vegetarian = 20 and Non-vegetarian = 30.

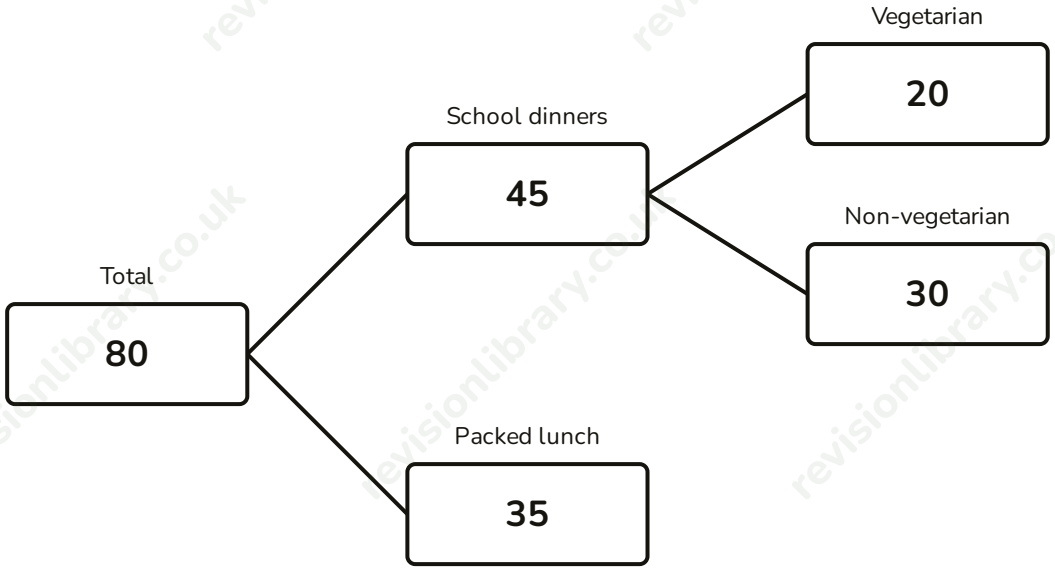


Diagram not drawn accurately

(a) Explain why the frequency tree cannot be correct. **(1)**

.....

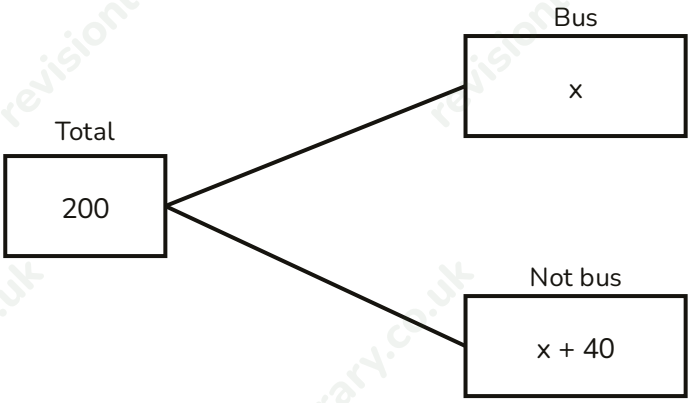
(b) The number of non-vegetarian pupils having school dinners, 30, is correct. Work out the correct number of vegetarian pupils having school dinners. **(1)**

.....

(Total for Question 8 is 2 marks)

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9 200 people were asked how they travel to work. The frequency tree shows the number who travel by bus as x, and the number who do not travel by bus as (x + 40).



(a) Form and solve an equation to find the value of x. **(3)**

.....

(b) Write down the number of people who do not travel by bus. **(1)**

.....

(Total for Question 9 is 4 marks)

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10 A charity records donations from 240 people. A frequency tree shows: Donated online 150, Donated in person 90. Of those who donated online, 90 used a one-off donation and 60 set up a monthly donation. Of those who donated in person, 30 were under 25 and 60 were 25 or older.

(a) Give the four end frequencies. **(2)**

.....

(b) Work out the probability that a donor is either a monthly online donor or an in-person donor aged 25 or older. Give your answer as a fraction. **(3)**

.....

(c) Find how many more monthly online donors are needed to reach the target of 96 monthly online donors. **(3)**

.....

(Total for Question 10 is 8 marks)

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11 A medical trial tests a new treatment. Out of 200 patients, 40% receive the treatment and 60% receive a placebo. Of those receiving the treatment, 75% show improvement. Of those receiving placebo, 20% show improvement.

(a) Complete the frequency tree with actual numbers. **(1)**

(b) Calculate the probability that a randomly chosen patient shows improvement. **(2)**

(c) Given a patient shows improvement, calculate the probability they were in the treatment group. Give your answer as a fraction in lowest terms. **(2)**

(Total for Question 11 is 5 marks)

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Mark scheme · 3.19 Frequency Trees: Test Pack

Question 1

40 and 20 cao **B1**

Answer: Drama 40, Not drama 20. (frequencies: 40 and 20).

Question 2

(a) 19 (64 - 45) **B1**

(a) Answer: 19

(b) 45 x 3/5 **M1**

(b) 27 cao **A1**

(b) Answer: 27

(c) 27 x 3.50 **M1ft**

(c) 94.50 (pounds), oe with correct units **A1ft**

(c) Answer: £94.50

Question 3

(a) 45/60 **M1**

(a) 3/4 oe **A1**

(a) Answer: 3/4

(b) 54 (45 + 9) **B1**

(b) Answer: 54

(c) 27/96, where weights = 96 - 60 = 36 and no classes = 36 - 9 = 27 **M1**

(c) 9/32 oe **A1**

(c) Answer: 9/32

Question 4

females = 360 - 240 = 120 **M1**

30 females are left-handed **M1**

90 **A1**

Answer: 90

Question 5

children = 60 **M1**

adults with ticket 36 and children with ticket 30 **M1**

total with tickets **M1**

54 **A1**

Answer: 54

Question 6

(a) 84 x 3/4 **M1**

(a) = 63 cso (method and answer 63 must both be shown) **A1**

(a) Answer: 63

(b) 21 (84 - 63) **B1ft**

(b) Answer: 21

(c) 63 x 2/9 **M1**

(c) 14 oe **A1**

(c) Answer: 14

Question 7

(a) 96 / 8 (= 12), oe **M1**

(a) 60 (12 x 5) cao **A1**

(a) Answer: 60

(b) 36 (12 x 3 or 96 - 60) **B1ft**

(b) Answer: 36

(c) 60 / 4 **M1ft**

(c) 15 **A1ft**

(c) Answer: 15

Question 8

(a) 20 + 30 = 50, which is not equal to 45 oe **B1**

(a) Answer: 20 + 30 = 50, not 45, so the branches do not add up to the school dinners total

(b) 15 (45 - 30) **B1ft**

(b) Answer: 15

Question 9

(a) x + (x + 40) = 200 **M1**

(a) 2x = 160 (or correct simplification, e.g. 2x + 40 = 200) **M1**

(a) x = 80 **A1**

(a) Answer: x = 80

(b) 120 (80 + 40) **B1ft**

(b) Answer: 120

Question 10

(a) 90 one-off online, 60 monthly online, 30 in-person under 25, 60 in-person 25 or older cao **B1**

(a) they total 240 oe **B1**

(a) Answer: Online one-off 90, Online monthly 60, In person under 25 = 30, In person 25 or older = 60.

(b) add frequencies 60 monthly online + 60 in-person 25+ = 120 oe **M1**

(b) probability 120/240 = 1/2 cao **A1**

(b) simplify to 1/2 and state clearly cao **A1**

(b) Answer: 1/2.

(c) calculate shortfall 96 - current monthly 60 = 36 oe **M1**

(c) answer 36 cao **A1**

(c) state reasoning: need 36 more to reach 96 cao **A1**

(c) Answer: 36 more monthly online donors are needed.

Question 11

(a) treatment 80, placebo 120 shown **B1**

(a) Answer: Treatment group 80; Placebo 120.

(b) compute improves: 80 x 0.75 = 60 and 120 x 0.20 = 24 or equivalent **M1**

(b) 84/200 = 21/50 cao **A1**

(b) Answer: 21/50

(c) use conditional probability: 60 / 84 or equivalent shown **M1**

(c) 5/7 cao **A1**

(c) Answer: 5/7

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