



3.19D Frequency Trees: Fluency and Exam Drill

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A class of 30 students is surveyed about how they travel to school. The frequency tree shows:
First branch: Cycles to school: Yes 12, No 18.
For those who cycle: Left-handed 4, Right-handed ____.
Complete the missing number in the tree.

(a) Complete the missing number.

(1)

(Total for Question 1 is 1 mark)

- 2** A survey of 80 local voters produced this frequency tree.
First split: Region North 48, South 32.
North split: Labour 20, Conservative 28.
South split: Labour 12, Conservative ____.
Complete the missing number.

(a) Complete the missing number.

(1)

(Total for Question 2 is 1 mark)

- 3** Using the voter tree from Question 2, work out the probability that a randomly chosen voter is from South and voted Labour.

(a) Work out $P(\text{South and Labour})$. Give your answer as a fraction in its simplest form.

(2)

(Total for Question 3 is 2 marks)

- 4** A survey of 80 voters (as in Question 2) asks for the probability that a randomly chosen voter is Conservative. Work out this probability and give your answer as a decimal to two decimal places.

(a) Calculate $P(\text{Conservative})$. Give your answer as a decimal to two decimal places. **(2)**

(Total for Question 4 is 2 marks)

- 5** From the voter tree in Question 2, work out the probability that a randomly chosen voter is from North given that they voted Labour. Give your answer as a fraction in its simplest form.

(a) Work out $P(\text{North} \mid \text{Labour})$, the probability the voter is from North given they voted Labour. **(2)**

(Total for Question 5 is 2 marks)

- 6** A sports club has 60 members. A frequency tree shows: Plays sport Yes 42, No 18. Of those who play sport: Football 25, Tennis 17. Work out the probability that a randomly chosen club member plays football. Give your answer as a fraction in its simplest form.

(a) Work out $P(\text{plays football})$. **(2)**

(Total for Question 6 is 2 marks)

- 7** A transport survey interviewed 250 people. The frequency tree shows: Use public transport 60%, Use car 40%.

Of those who use public transport, 30% use bus and the rest use train.
Complete the tree and work out how many people use the train.

(a) Complete the tree and find the number of people who use the train. **(3)**

(Total for Question 7 is 3 marks)

8 In a survey of 200 households, 90 own a dog and 110 do not. Of the dog owners, 72 have their dog vaccinated.

Work out the probability that a randomly chosen household has a vaccinated dog. Give your answer in simplest fractional form.

- (a) Work out the probability that a randomly chosen household has a vaccinated dog. (3)
Give your answer in simplest form.

(Total for Question 8 is 3 marks)

9 Show that the probability a randomly chosen household from Question 8 does not own a dog is $\frac{11}{20}$.

- (a) Show that $P(\text{no dog}) = \frac{11}{20}$. (3)

(Total for Question 9 is 3 marks)

10 A language survey of 180 students shows that the probability a randomly chosen student studies a language is $\frac{2}{3}$.

Work out how many students study a language.

- (a) Work out the number of students who study a language. (3)

(Total for Question 10 is 3 marks)

11 A school with 250 pupils is surveyed about year group and playing an instrument. The frequency tree shows: Year 10 40%, Year 11 60%.

In Year 10, 30% play an instrument. In Year 11, 20% play an instrument.

(a) Complete the tree and work out the probability that a randomly chosen pupil plays an instrument. (3 marks)

(b) Given that a pupil plays an instrument, work out the probability that the pupil is in Year 10. (1 mark)

(a) (a) Work out the probability that a randomly chosen pupil plays an instrument. (3)
Give your answer as a fraction in simplest form.

(b) (b) Given that a pupil plays an instrument, work out the probability the pupil is in Year 10. Give your answer as a fraction. (1)

(Total for Question 11 is 4 marks)

12 A survey of 210 people records age and smartphone ownership. The ratio Under 30: 30 and over is 2: 1. Of those under 30, 120 own a smartphone and the rest do not.

(a) Work out how many people are 30 and over. (1 mark)

(b) Work out the probability that a randomly chosen person is under 30 and does not own a smartphone. Give your answer in simplest form. (3 marks)

(a) (a) Work out the number of people aged 30 and over. (1)

(b) (b) Work out $P(\text{under 30 and does not own a smartphone})$. Give your answer in simplest form. (3)

(Total for Question 12 is 4 marks)

- 13** A charity surveyed 500 people. The tree shows: Donated before and Not donated before. Of those who donated before, 80 would donate again. Of those who had not donated before, x would donate now and 90 would not. The survey finds that the probability a randomly chosen person will donate now is 0.34.

Work out the value of x .

- (a) Work out x , the number of people who had not donated before but would donate now. (5)

(Total for Question 13 is 5 marks)

- 14** A school surveyed 600 pupils about sport. The frequency tree shows: Plays sport Yes 360, No 240.

Of those who play sport, two thirds play team sports and the rest play individual sports. Of the team sport players, 40% are team captains.

Work out the probability that a randomly chosen pupil plays team sport and is not a captain. Give your answer in simplest form.

- (a) Complete the tree and work out $P(\text{plays team sport and is not a captain})$. Give your answer in simplest form. (5)

(Total for Question 14 is 5 marks)

Mark scheme · 3.19D Frequency Trees: Fluency and Exam Drill

Question 1

- (a) **B1** 8 cao
- (a) **Answer: 8**

Question 2

- (a) **B1** 20 cao
- (a) **Answer: 20**

Question 3

- (a) **M1** use $12/80$ oe
- (a) **A1** $3/20$ cao
- (a) **Answer: $3/20$**

Question 4

- (a) **M1** use $(28 + 20) / 80$ oe
- (a) **A1** 0.60 au3dp cao
- (a) **Answer: 0.60**

Question 5

- (a) **M1** use $20 / (20 + 12)$ oe
- (a) **A1** $5/8$ cao
- (a) **Answer: $5/8$**

Question 6

- (a) **M1** use $25/60$ oe
- (a) **A1** $5/12$ cao
- (a) **Answer: $5/12$**

Question 7

- (a) **M1** calculate 60% of 250 = 150 oe
- (a) **M1** calculate train = 70% of 150 = 105 oe
- (a) **A1** 105 cao
- (a) **Answer: 105**

Question 8

- (a) **M1** use $72/200$ oe
- (a) **M1** simplify $72/200$ to $9/25$ oe
- (a) **A1** $9/25$ cao
- (a) **Answer: $9/25$**

Question 9

- (a) **M1** write $110/200$ oe
- (a) **M1** simplify fraction $110/200$ oe
- (a) **A1** $11/20$ cso
- (a) **Answer: $11/20$**

Question 10

- (a) **M1** use $2/3$ of 180 oe
- (a) **M1** calculate $180 \times 2/3 = 120$ oe
- (a) **A1** 120 cao
- (a) **Answer: 120**

Question 11

- (a) **M1** find Year 10 count = 40% of 250 = 100 and Year 11 = 150 oe
- (a) **M1** find instrument counts: Year10 30% of 100 = 30; Year11 20% of 150 = 30 oe
- (a) **A1** $60/250 = 6/25$ cao
- (a) **Answer: 6/25**
- (b) **B1** $1/2$ cao
- (b) **Answer: 1/2**

Question 12

- (a) **B1** 70 cao
- (a) **Answer: 70**
- (b) **M1** calculate under 30 count = $2/3$ of 210 = 140 oe
- (b) **M1** find not own = $140 - 120 = 20$ oe
- (b) **A1** $20/210 = 2/21$ cao
- (b) **Answer: 2/21**

Question 13

- (a) **M1** calculate total who will donate now = 0.34×500 oe
- (a) **M1** evaluate $0.34 \times 500 = 170$ oe
- (a) **M1** write equation $80 + x = 170$ oe
- (a) **M1** solve $x = 90$ oe
- (a) **A1** 90 cao
- (a) **Answer: 90**

Question 14

- (a) **M1** find team sport count = $2/3$ of 360 = 240 oe
- (a) **M1** find not captain among team = 60% of 240 = 144 oe
- (a) **M1** form probability $144/600$ oe
- (a) **M1** simplify $144/600$ to $6/25$ oe
- (a) **A1** $6/25$ cao
- (a) **Answer: 6/25**