Year 11 Mathematics Advanced

Topic: Probability and Data (4 of 5)
Review Questions: Data
Term 3, 2026

How to use this review set

These are real past-paper questions, grouped by question pattern. The grey label on each question shows where it is from and its marks.

- The questions are grouped by the pattern that keeps coming up in exams, a few of each in a row, running from the plainer patterns into the harder ones near the end. Work through them and you will meet every type an exam can throw at you.
- This set **is your diagnostic**. Working through it shows you exactly which patterns are solid and which need work. Attempt every question properly in your own book, and go back to your notes to help you work through tough questions if needed.
- Every question you get wrong, need help with or struggle with goes in your **Mistakes Log**, which you should be working on daily to get you exam-ready.

Contents

Data

1. Frequency tables, mode and median
2. Cumulative-frequency graphs, histograms and polygons
3. Relative frequency and types of data

Data

1. Frequency tables, mode and median

Q1 Killara 2022 Prelim Q2 · **1 mark**

A spinner can land on the colour red, blue, yellow or green. After the spinner is spun 50 times, the results are recorded in the table below.

Colour	Red	Blue	Yellow	Green
Frequency	13	12	10	15

What is the relative frequency of spinning a red or green?

(A) $\frac{14}{25}$

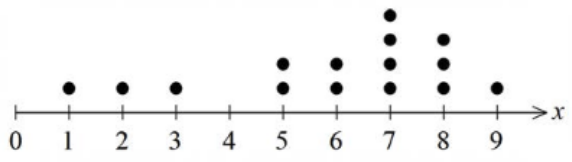
(B) $\frac{27}{50}$

(C) $\frac{1}{2}$

(D) $\frac{23}{50}$

Q2 North Sydney Girls 2024 Trial Q6 · **1 mark**

Consider the dot plot shown.



Which row of the table correctly describes the data?

(A) Mode = 7; Positively Skewed

(B) Median = 7; Negatively Skewed

(C) Mean = 7; Positively Skewed

(D) Range = 4; Negatively Skewed

Q3 Caringbah 2024 Trial Q9 · **1 mark**

The following cumulative frequency table shows heights of students at a school.

Height (cm)	Cumulative Frequency
131 – 140	70
141 – 150	210
151 – 160	420
161 – 170	680
171 – 180	800

What is the height of a student in the 7th decile?

(A) 131 – 140 cm

(B) 151 – 160 cm

(C) 161 – 170 cm

(D) 171 – 180 cm

Q4 James Ruse 2022 Trial Q4 · **1 mark**

The following back-to-back stem and leaf plot displays the test results of a class of 24 students.

Boys					Girls				
			1	2	1	2	4		
			3	3	0	2	3	5	
	9	7	4	4	4	5	5	9	9
4	6	2	2	5	3				
				6	1	9			

What is the median and the mode for the class?

(A) Median is 45 and Mode is 49

(B) Median is 46 and Mode is 44

(C) Median is 46 and Mode is 49

(D) Median is 45 and Mode is 44

Q5 Glenwood 2025 Trial Q1 · **1 mark**

The stem and leaf plot below shows the number of lollies that fourteen students in the class have eaten this week. Two students were absent when this data was collected. Once their data was added to the data of the rest of the class, the grouped frequency distribution table below was completed. The cumulative frequency for the $10-19$ class is marked with an X.

0	0	0	2	5	
1	1	2	2	6	9
2	0	4	4	7	
3	3				

Which of the following values for X could be true?

(A) $X = 9$

(B) $X = 12$

(C) $X = 14$

(D) $X = 16$

Q6 2022 HSC Q11 · **2 marks**

The table shows the types of customer complaints received by an online business in a month.

Type of complaint	Frequency	Cumulative frequency	Cumulative percentage
Stock shortage	98	98	49
Delivery fee	62	A	80
Delivery time	24	184	92
Damaged item	8	192	B
Returns policy	6	198	99
Product information	2	200	100
Total	200		

(a) What are the values of A and B?

Q7 Abbotsleigh 2023 Trial Q12 · **7 marks**

(a) The frequency distribution table and cumulative frequency distribution table below show the distribution of the heights of trees in a garden. Some of the values are missing.

Height (m)	Frequency	Height less than	Cumulative Frequency
0.1–0.4		0.45	2
0.5–0.8	6	0.85	
0.9–1.2		1.25	15
1.3–1.6	11	1.65	
1.7–2.0		2.05	40
2.1–2.4	3	2.45	

(i) Complete the tables by filling in the missing values. (2 marks)

(ii) What is the modal class? (1 mark)

(iii) If a tree is randomly selected, find the probability the height is less than 1.25 m but not less than 0.45 m. (1 mark)

(b) Let A and B be two events such that $P(A) = 0.4$, $P(B) = 0.55$ and $P(B \mid A) = 0.6$.

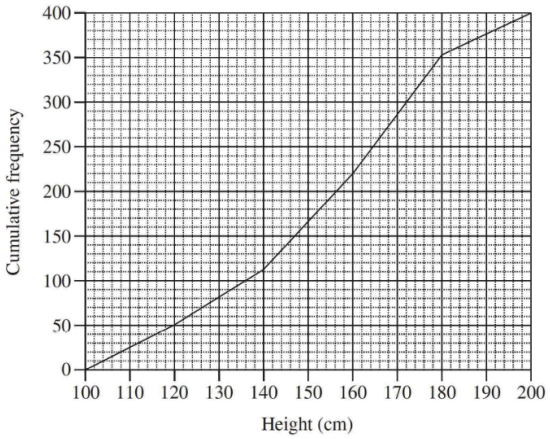
(i) Determine whether A and B are independent events. (1 mark)

(ii) Find $P(A \cup B)$. (2 marks)

2. Cumulative-frequency graphs, histograms and polygons

Q8 Penrith 2022 Trial Q6 · **1 mark**

The height of 400 students were measured. The results are displayed in the cumulative frequency polygon shown below.



What is the median height of the students?

(A) 150

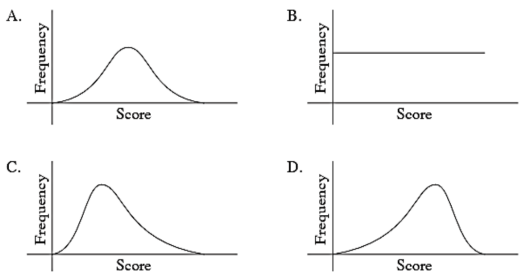
(B) 156

(C) 165

(D) 200

Q9 North Sydney Girls 2025 Trial Q1 · **1 mark**

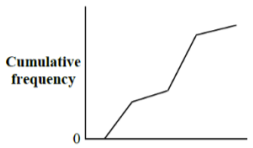
Which graph represents a negatively skewed distribution?



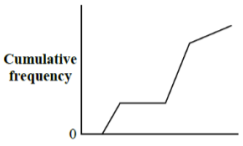
Q10 Hurlstone 2021 Trial Q7 · **1 mark**

Which of the following CANNOT be a cumulative frequency polygon?

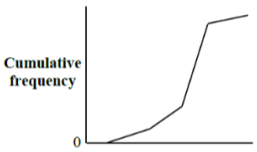
A.



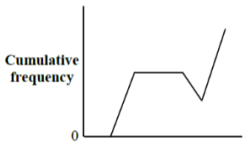
B.



C.

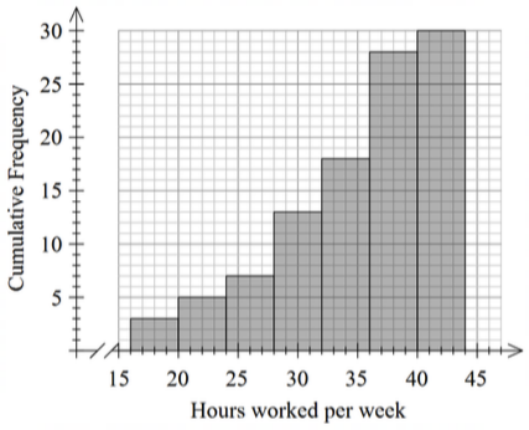


D.



Q11 Hurlstone 2021 Trial Q15 · **1 mark**

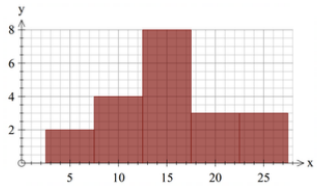
Cole is designing a survey to ask his co-workers about their job satisfaction. One of Cole's survey questions asked how many hours each respondent works at the company. The results are shown in the cumulative frequency histogram below.



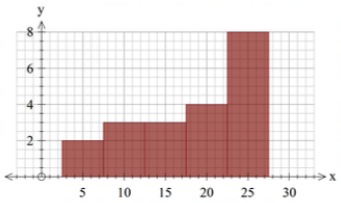
(a) What is the range of responses that gave the greatest 40% of hours worked?

Q12 Killara 2023 Trial Q4 · **1 mark**

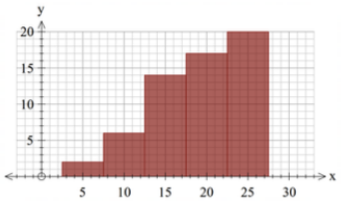
A frequency histogram is given below where the y-axis represents the frequency. Which one of the following is the corresponding cumulative frequency histogram?



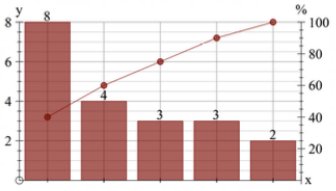
A.



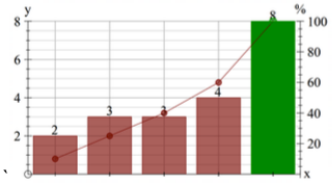
B.



C.

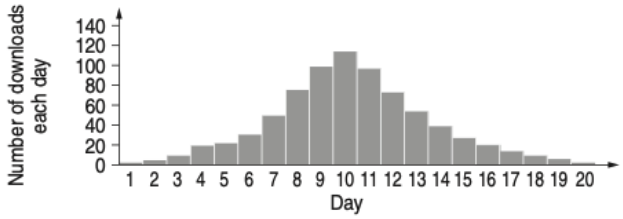


D.



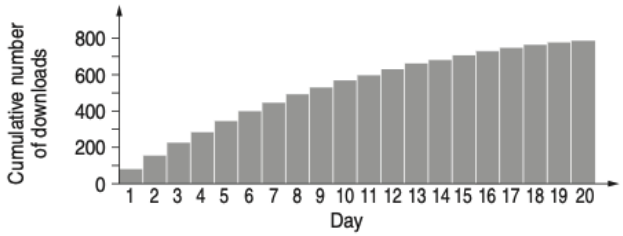
Q13 2021 HSC Q4 · **1 mark**

The number of downloads of a song on each of twenty consecutive days is shown in the following graph. Which of the following graphs (A–D) best shows the cumulative number of downloads up to and including each day?

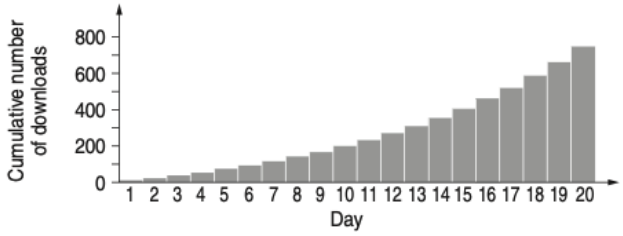


Which of the following graphs best shows the cumulative number of downloads up to and including each day?

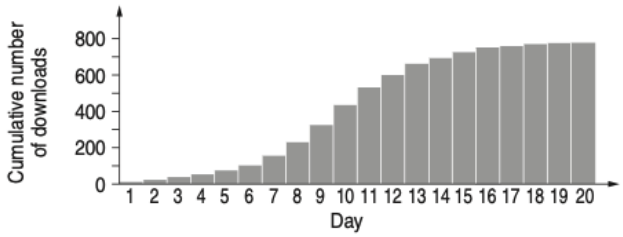
A.



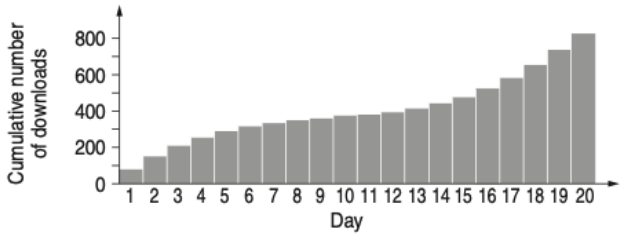
B.



C.

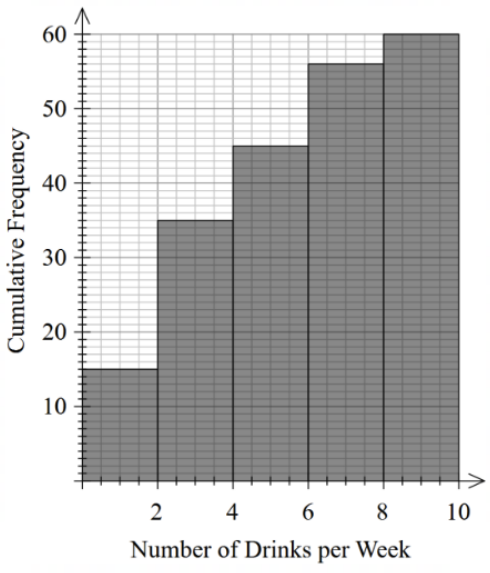


D.



Q14 Trinity Grammar 2022 Trial Q29 · **2 marks**

Lizzie is a university student collecting data about her classmates' alcohol consumption. A question in her survey asks the respondent to indicate how many alcoholic drinks they typically consume each week. The data collected is displayed in the cumulative frequency histogram.



(a) How many drinks per week do the top decile of respondents consume?

3. Relative frequency and types of data

Q15 Hurlstone 2022 Prelim Q2 · **1 mark**

Which one of the following is *not* a discrete random variable?

(A) The number of kilometres travelled per litre of petrol.

(B) The number of motorists buying petrol at a service station.

(C) The number of passengers in a car filling up with petrol at a service station.

(D) The number of times per week a motorist needs to refill their car with petrol.

Q16 Sydney Girls 2023 Trial Q1 · **1 mark**

Which is an example of discrete numerical data?

(A) The weight of baby goats.

(B) The month in which a birthday falls.

(C) The number of biscuits in a packet.

(D) A grade of A to D in an exam.

Q17 Hurlstone 2021 Prelim Q19 · **1 mark**

The table below shows the results of a survey conducted on a Year 11 class that asks how many siblings each student has.

Number of Siblings	Frequency
0	2
1	8
2	5
3	3
4	1

What is the relative frequency of students in this class that have 2 siblings?

(A) $\frac{1}{2}$

(B) $\frac{5}{19}$

(C) 5

(D) 15

Q18 Barker 2022 Trial Q24 · **3 marks**

A film director invites 24 film critics to rate his latest film out of 5 stars. The table below shows the ratings given by the film critics:

Number of stars	Frequency
0	3
1	4
2	5
3	7
4	3
5	2

The director decided to record the gender of each film critic along with their review score in a two-way table:

	Male	Female	Total
3 or more stars			
Less than 3 stars		9	
Total	11		

(a) Using the information stated previously, complete the rest of the above two-way table. (2 marks)

(b) What is the probability a film critic is male, given the critic gave the film a score of 3 or more stars? (1 mark)

Q19 Hurlstone 2024 Prelim Q9 · **1 mark**

In one class at HAHS, 24 out of 30 students surveyed said that they take a train to school. Based on this survey, how many out of the 960 students at HAHS take a train to school?

(A) 576

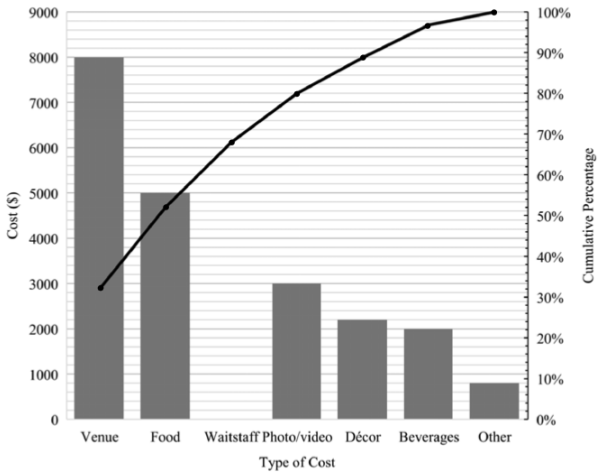
(B) 768

(C) 800

(D) 936

Q20 North Sydney Girls 2024 Trial Q13 · **3 marks**

The following Pareto chart shows the distribution of costs for an end-of-year event.



(a) Use the graph to estimate the percentage of the total cost spent on 'Waitstaff'? (1 mark)

(b) Find the total cost for this event. (1 mark)

(c) Find the cost spent on 'Waitstaff'. (1 mark)

Q21 Normanhurst Boys 2022 Trial Q20 · **3 marks**

Thirty Transit Officers patrolled the train line between Strathfield and Hornsby for three days. The number of ticket infringements issued by each Transit Officer over their three day blitz is summarised in the following table.

Number of ticket infringements	Frequency
0	12
1	5
2	6
3	3
4	3
5	1

(a) Determine the median number of infringements issued and describe the skewness of the data. (2 marks)

(b) There are 120 Transit Officers patrolling the rail network. Use the sample data in the table to estimate how many of these Transit Officers would have issued more than two ticketing infringements within their three day blitz. (1 mark)