

Grouped frequency tables

Year 7 About 65 minutes No calculator 46 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-grouped-frequency-tables/

Date _____

A Do Now

Quick questions to start.

- A1

Needed today

[1 mark]

Which of these times are in the class $20 < t \leq 30$?
20, 24.5, 30, 30.5
- A2

Needed today

[1 mark]

A pie chart shows 40 people.
How many degrees stand for one person?

Answer _____

Answer _____

- A3

Last lesson

[1 mark]

Make x the subject of $y = 2x + 9$.
- A4

From chapter 3

[1 mark]

A bag holds 3 red and 9 blue counters. One is taken at random. Work out the probability that it is red.

Answer _____

Answer _____

B Example, then your turn

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Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

These are the times, in minutes, that 18 people waited for a bus.

7, 13, 22, 4, 20, 9, 25, 11, 16, 3, 28, 14, 19, 8, 21, 12, 6, 27

Complete the frequency table.

Time, t (min)	Frequency
$0 < t \leq 10$	?
$10 < t \leq 20$	?
$20 < t \leq 30$	?

Hint Go through the list once, in order, and tick the class for each time. 20 goes in $10 < t \leq 20$, because that class includes 20.

- B1

These are the masses, in kg, of 15 parcels.

[3 marks]

1.5, 3.2, 4.0, 0.8, 5.6, 2.0, 3.9, 4.7, 1.1, 2.6, 5.2, 3.4, 0.6, 4.4, 2.9

Write down the three frequencies, in order.

Mass, m (kg)	Frequency
$0 < m \leq 2$	?
$2 < m \leq 4$	?
$4 < m \leq 6$	?

Answer _____

EXAMPLE 2

The table shows the masses of 25 eggs. Write down the modal class. One egg is picked at random. Work out the probability that it weighs more than 60 g.

Mass, m (g)	Frequency
$50 < m \leq 55$	3
$55 < m \leq 60$	8
$60 < m \leq 65$	10
$65 < m \leq 70$	4

Hint The modal class has the highest frequency. For the probability, count the eggs in every class above 60 g and put that over the total.

EXAMPLE 3

At a party, 9 people are aged $0 < a \leq 20$, 15 are aged $20 < a \leq 40$, 8 are aged $40 < a \leq 60$ and 4 are aged $60 < a \leq 80$. Work out the angle of each sector for a pie chart of the ages.

Hint A full circle is 360° , shared between 36 people.

- B2** The table shows the lengths of 30 phone calls. Write down the modal class. One call is picked at random. Work out the probability that it lasted more than 10 minutes, in its simplest form. [3 marks]

Length, t (min)	Frequency
$0 < t \leq 5$	12
$5 < t \leq 10$	9
$10 < t \leq 15$	6
$15 < t \leq 20$	3

Answer

- B3** Of 40 students, 6 have heights $130 < h \leq 140$ cm, 14 have $140 < h \leq 150$, 12 have $150 < h \leq 160$ and 8 have $160 < h \leq 170$. Work out the angle of each sector for a pie chart, in order. [3 marks]

Answer

EXAMPLE 4

These are the numbers of texts 20 pupils sent in one day.

3, 12, 7, 18, 0, 9, 14, 5, 11, 2, 6, 8, 13, 6, 19, 10, 12, 15, 1, 11

Make a grouped frequency table with classes 0–4, 5–9, 10–14 and 15–19. Why are these classes not written like $0 < n \leq 4$?

Hint A number of texts is always a whole number, so nothing falls between 4 and 5.

B4 These are the numbers of books 18 pupils read in a term. [3 marks]

2, 9, 5, 11, 0, 7, 4, 13, 6, 3, 8, 10, 1, 5, 12, 7, 9, 6

Using classes 0–3, 4–7, 8–11 and 12–15, write down the four frequencies in order.

Answer

c Practice

Year 7

- C1** The table shows the times 50 runners took. Work out the missing frequency. [2 marks]

Time, t (min)	Frequency
$20 < t \leq 30$	12
$30 < t \leq 40$	?
$40 < t \leq 50$	15
$50 < t \leq 60$	9

Answer

- C2** The table shows the times 40 swimmers took. One swimmer is picked at random. Work out the probability that they took 30 seconds or less. [2 marks]

Time, t (s)	Frequency
$20 < t \leq 25$	7
$25 < t \leq 30$	16
$30 < t \leq 35$	12
$35 < t \leq 40$	5

Answer

- C3** Sam wants to know how long pupils at his school spend on homework each night. He asks 6 pupils in his own top-set maths class. Give two reasons why this is not a good way to collect the data. [2 marks]

- C4** Ravi groups some heights into the classes 140–150 cm, 150–160 cm and 160–170 cm. Explain what is wrong with his classes. [2 marks]

D1

Ella puts the times 5, 10, 14, 20, 23, 17, 9 and 28 minutes into the classes $0 < t \leq 10$, $10 < t \leq 20$ and $20 < t \leq 30$. She says, "There are 4 times in the class $10 < t \leq 20$."

[3 marks]

Ella is wrong. Explain why, and give the correct frequency of each class.

Answer

D2

These are the heights, in cm, of 24 plants.

12, 35, 8, 22, 27, 19, 31, 14, 26, 9, 18, 24, 33, 21, 16, 28, 5, 20, 29, 38, 13, 25, 30, 23

- (a) Complete the frequency table. Write [2 marks]
the four frequencies in order.

Height, h (cm)	Frequency
$0 < h \leq 10$	?
$10 < h \leq 20$	?
$20 < h \leq 30$	?
$30 < h \leq 40$	?

Answer

- (b) The data is shown in a pie chart. Work [3 marks]
out the angle of the sector for the modal class.

Answer

Total for D2: 5 marks

D3

The table shows the ages of 60 visitors to a museum.

- (a) What percentage of the visitors were [2 marks]
older than 40?

Age, a (years)	Frequency
$0 < a \leq 20$	9
$20 < a \leq 40$	21
$40 < a \leq 60$	18
$60 < a \leq 80$	12

Answer

- (b) One visitor is picked at random. Find [2 marks]
the probability that they were 20 or younger, in its simplest form.

Answer

Total for D3: 4 marks

D4

The table shows the lengths of 40 phone calls. In a pie chart of the data, the sector for $5 < t \leq 10$ is 108° . There are twice as many calls in $10 < t \leq 15$ as in $15 < t \leq 20$.

(a)

Work out the three missing frequencies. Write them in order.

[4 marks]

Answer

(b)

Work out the angle of the sector for $0 < t \leq 5$.

[2 marks]

Answer

Total for D4: 6 marks

Length, t (min)	Frequency
$0 < t \leq 5$	13
$5 < t \leq 10$	?
$10 < t \leq 15$	?
$15 < t \leq 20$	?

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

E1

30 pupils took a test. Their marks are grouped in the classes 0–10, 11–20, 21–30 and 31–40. In a pie chart of the marks, the sectors for 0–10 and 11–20 are 72° and 132° . Three more pupils scored 21–30 than scored 31–40. Work out the four frequencies.

[4 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

E1

Hint 1

How many degrees stand for one pupil?

Hint 2

$360 \div 30 = 12$, so 72° is 6 pupils.

Hint 3

$30 - 6 - 11 = 13$ pupils are left for two classes that differ by 3.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can sort data into classes.

I can place a value on a class boundary.

I can find a modal class, angles and probabilities.

I can spot poor classes or a poor sample.

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