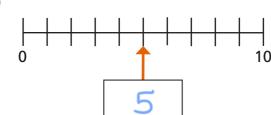# Find the mean from a grouped frequency table

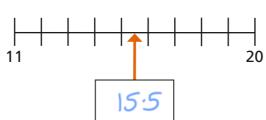**H**

1 What number is at the midpoint of each number line?
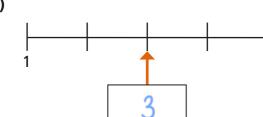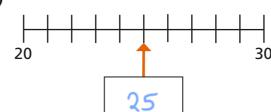
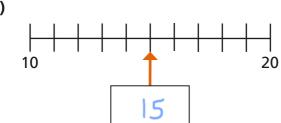**a)**

0 ———————— 10

5

d)

11 ———————— 20

15·5

b)

1 ———————— 5

3

e)

20 ———————— 30

25

c)

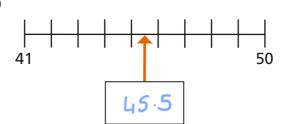10 ———————— 20

15

f)

41 ———————— 50

45·5

2 Write the midpoints of the class intervals.

a) $0 \leq x < 10$

5

c) $10 \leq x < 20$

15

e) $20 \leq x < 40$

30

b) $1 \leq x < 10$

5·5

d) $11 \leq x < 20$

15·5

f) $21 \leq x < 40$

30·5

3 The table shows Mr Glover's monthly phone bills over two years.

Complete the table.

Phone bill, x (£)	Frequency	Midpoint	frequency × midpoint
$0 \leq x < 10$	7	5	7 × 5 = 35
$10 \leq x < 20$	9	15	9 × 15 = **135**
$20 \leq x < 30$	5	**25**	**5 × 25 = 125**
$30 \leq x < 40$	3	**35**	**3 × 35 = 105**
	24		**400**

Complete the calculation to find an estimate of the mean of his phone bills.

estimate of mean $\approx \dfrac{\text{total cost}}{\text{total frequency}} = \dfrac{\boxed{400}}{\boxed{24}} = \boxed{£16.67}$

4 The table shows information about the amount of time a group of students spent online one evening.

Complete the table.

Time online, h (hours)	Frequency	Midpoint	frequency × midpoint
$0 \leq h < 1$	2	0.5	**1**
$1 \leq h < 2$	12	**1·5**	**18**
$2 \leq h < 3$	7	**2·5**	**17·5**
$3 \leq h < 4$	5	**3·5**	**17·5**
$4 \leq h < 6$	4	**5**	**20**
	30		**74**

Complete the calculation to find an estimate of the mean time spent online.

estimate of mean $\approx \dfrac{\text{total time}}{\text{total frequency}} = \dfrac{\boxed{74}}{\boxed{30}} = \boxed{2.5 \text{ h}}$

5 The table shows some information about the masses of 30 pets.

Mass, m (kg)	Frequency		
$0 \leq m < 2$	8	1	8
$2 \leq m < 5$	4	3.5	14
$5 \leq m < 10$	12	7.5	90
$10 \leq m < 15$	5	12.5	62.5
$15 \leq m < 25$	1	20	20
	30		194.5

a) Work out an estimate for the mean mass of the pets.

6.48 kg

b) Write the modal class of the masses.

$5 \leq m < 10$

6 The table shows some information about the waiting times at a post office one lunchtime.

Waiting time, t (minutes)	$0 \leq t < 3$	$3 \leq t < 4$	$4 \leq t < 5$	$5 \leq t < 10$
	1.5	3.5	4.5	7.5
Frequency	20	15	8	2
	30	52.5	36	15

Work out an estimate for the mean waiting time.

$\dfrac{133.5}{45} = 2.9666...$

2.97 mins

7 The table shows the amount of time people took to get out of an escape room.

Time, t (minutes)	Frequency	Midpoint	
$0 < t \leq 15$	3	7.5	22.5
$15 < t \leq 30$	10	22.5	225
$30 < t \leq 40$	17	35	595
$40 < t \leq 50$	12	45	540
$50 < t \leq 60$	20	55	1,100
	62		2,482.5

a) Fill in any missing information in the table.

b) Write the modal class of the time taken.

$50 < t \leq 60$

c) Work out an estimate for the mean time taken.

40.04 mins

d)

> I think the intervals should be $0 \leq t < 15$ not $0 < t \leq 15$, so the answer will be wrong.

Do you agree with Mo? __No__

Explain your answer.

It doesn't affect the midpoint and therefore doesn't affect the estimate of the mean.