Name:

Exam Style Questions

Estimated Mean

Corbettmaths

Equipment needed: Calculator,pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 55

Answers and Video Solutions

1. The table below shows the length of 100 fish from a local river.

Length, L cm	Frequency	Midpoint	fx
$0 < L \leq 10$	21	$\times 5 =$	105
$10 < L \leq 20$	11	$\times 15 =$	165
$20 < L \leq 30$	31	$\times 25 =$	775
$30 < L \leq 40$	12	$\times 35 =$	420
$40 < L \leq 50$	25	$\times 45 =$	+ 1125
	100		2590

Calculate an estimate of the mean length of the fish.

$2590 \div 100 = 25.9$

25.9 .....cm

(4)

2. The table shows the heights of 50 students.

Height, h cm	Frequency		midpoint x		fx
110 ≤ h < 120	3	x	115	=	345
120 ≤ h < 130	8	x	125	=	1000
130 ≤ h < 140	9	x	135	=	1215
140 ≤ h < 150	23	x	145	=	3335
150 ≤ h < 160	7	x	155	=	1085
	50				6980

(a) Write down the modal class interval.

140 ≤ h < 150

.....

(1)

(b) Work out an estimate for the mean height of the students.

6980 ÷ 50

139.6

.....cm

(4)

3. James recorded the times, in minutes, for 20 students to complete a test.
The information about these times is shown in the table.

Time (t mins)	Frequency	midpoint	fx
$0 < t \leq 4$	4	2	8
$4 < t \leq 8$	11	6	66
$8 < t \leq 12$	4	10	40
$12 < t \leq 16$	1	14	14
	20		128

(a) Write down the modal class interval.

$4 < t \leq 8$

(1)

(b) Work out an estimate for the mean time taken.

$128 \div 20$

$6 \cdot 4$ minutes

(4)

4. Timothy asked 30 people how long it takes them to get to school.

The table shows some information about his results.

Time (t mins)	Frequency
$0 < t \leq 10$	2
$10 < t \leq 20$	8
$20 < t \leq 30$	12
$30 < t \leq 40$	7
$40 < t \leq 50$	1
	30

midpoint | fx
5 | 10
15 | 120
25 | 300
35 | 245
45 | 45
+
720

Work out an estimate for the mean time taken.

$720 \div 30 = 24$

24 .....minutes

(4)

5. The time for ten students to complete a race is below.

Time (t seconds)	Frequency
$20 < t \leq 40$	3
$40 < t \leq 60$	5
$60 < t \leq 80$	2
	10

midpoint: 30, 50, 70

fx: 90, 250, + 140 = 480

(a) Work out what fraction of students took over one minute.

$\frac{2}{10}$

$\frac{1}{5}$

(1)

(b) Write down the modal interval.

$40 < t \leq 60$

(1)

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

$480 \div 10$

48 seconds

(4)

6. The table shows information about the ages of footballers in a squad.

Age, y years	Frequency
$16 < y \leq 20$	6
$20 < y \leq 24$	10
$24 < y \leq 28$	11
$28 < y \leq 32$	13
$32 < y \leq 36$	4
	44

midpoint	fx
18	108
22	220
26	286
30	390
34	136
	1140

Work out an estimate for the mean age.
Give your answer to 3 significant figures.

$1140 \div 44 = 25.9090...$

25.9

.....

(4)

7. The speed of vehicles passing through a village were recorded.

Speed, s mph	Frequency	
$15 < s \leq 20$	16	x
$20 < s \leq 25$	35	x
$25 < s \leq 30$	68	x
$30 < s \leq 35$	11	x
$35 < s \leq 40$	2	x
	132	

midpoint | fx

17.5 = 280

22.5 = 787.5

27.5 = 1870

32.5 = 357.5

37.5 = 75

3370

(a) Calculate an estimate of the mean speed.

$3370 \div 132 = 25.5303...$

25.53 .....mph

(4)

The police gave speeding tickets to the driver of any vehicle travelling faster than 35mph.

(b) Work out the percentage of the drivers that were given speeding tickets.

$\frac{2}{132} = 0.01515...$

1.515...

1.515 .....%

(2)

8. Elena and Michelle own a shop.

The table shows information about the amount of money spent by Elena's last 20 customers.

Amount, £x	Frequency	midpoint	fx
$0 < x \leq 50$	7	25	175
$50 < x \leq 100$	2	75	150
$100 < x \leq 150$	0	125	0
$150 < x \leq 200$	0	175	0
$200 < x \leq 250$	1	225	225
	10		550

(a) Work out an estimate for the mean amount of money spent.

$550 \div 10$

£ 55

(4)

Michelle says that the mean may not be the best average to use for this information.

(b) Do you agree with Michelle?
Explain your answer.

Yes, the mean is affected by outliers.

(1)

9. The table below shows the distance travelled to work by 80 workers.

Distance, x miles	Frequency	midpoint	fx
$0 < x \leq 5$	13	2.5	32.5
$5 < x \leq 10$	12	7.5	90
$10 < x \leq 15$	29	12.5	362.5
$15 < x \leq 20$	20	17.5	350
$20 < x \leq 25$	6	22.5	135
	80		970

(a) Work out an estimate of the mean distance travelled.

$970 \div 80$

12.125 .....miles

(4)

(b) Explain why it is not possible to calculate the exact mean distance travelled using the information from the table.

The actual distances are not known, therefore the exact mean cannot be calculated.

(1)

10. Antoni is raising money for charity.

The table shows information about the donations received.

Donation, £x	Frequency	midpoint	fx
$0 < x \leq 5$	90	2.5	225
$5 < x \leq 10$	70	7.5	525
$10 < x \leq 20$	32	15	480
$20 < x \leq 50$	5	35	175
$50 < x \leq 100$	3	75	225
	200		1630

Antoni says that the average donation is £10

By calculating an estimate for the mean donation received, decide if you agree with Antoni.

$1630 \div 200 = 8.15$

No, the estimated mean of £8.15 is much lower than £10.

(4)

11. The table below shows information about the ages of employees for a company.

Ages, x years	Frequency
$20 < x \leq 30$	y
$30 < x \leq 35$	40
$35 < x \leq 40$	24
$40 < x \leq 50$	28
$50 < x \leq 80$	10

$y + 102$

midpoint | fx

25 | $25y$

32.5 | 1300

37.5 | 900

45 | 1260

65 | 650

$25y + 4110$

Miss Rashid calculated the estimated mean from the information in the table to be 34.75 years

Find the value of y.

$$\frac{25y + 4110}{y + 102} = 34.75$$

$$25y + 4110 = 34.75(y + 102)$$

$$25y + 4110 = 34.75y + 3544.5$$

$$-3544.5 \qquad -3544.5$$

$$25y + 565.5 = 34.75y$$

$$-25y \qquad -25y$$

$$565.5 = 9.75y$$

$$\div 9.75 \qquad \div 9.75$$

$$58 = y$$

58

.....

(5)