M1.

Alternative method 1

27.5 or 26.5 or 20.5 or 19.5 or
15.5 or 14.5 or 14.35 or 14.25 or
19.25 or 19.15 or 1.55 or 1.45

Any one seen

B1

a bound of 27 ÷ a bound of 1.5

Must see the calculation written down
26.5 ≤ a bound of 27 ≤ 27.5 but not 27
1.45 ≤ a bound of 1.5 ≤ 1.55 but not 1.5
eg 1 27.49 ÷ 1.45
eg 2 26.45 ÷ 1.54999

M1

26.5 ÷ 1.55

Must see the calculation written down
26.5 ÷ 1.55 scores B1 M1 M1

M1

[17.0, 17.1]

Must see method

A1

Alternative method 2

27.5 or 26.5 or 20.5 or 19.5 or
15.5 or 14.5 or 14.35 or 14.25 or
19.25 or 19.15 or 1.55 or 1.45

Any one seen

B1

17 × a bound of 1.5

Must see the calculation written down

1.45 ≤ a bound of 1.5 ≤ 1.55 but not 1.5
eg 1 17 × 1.45
eg 2 17 × 1.54999

M1

17 × 1.55

Must see the calculation written down
17 × 1.55 scores B1 M1 M1

M1

26.35 and 26.5

Must see method

A1

Alternative method 3

27.5 or 26.5 or 20.5 or 19.5 or
15.5 or 14.5 or 14.35 or 14.25 or
19.25 or 19.15 or 1.55 or 1.45

Any one seen

B1

a bound of 27 ÷ 17

Must see the calculation written down
26.5 ≤ a bound of 27 ≤ 27.5 but not 27
eg 1 27.49 ÷ 17
eg 2 26.45 ÷ 17

M1

26.5 ÷ 17

Must see the calculation written down
26.5 ÷ 17 scores B1 M1 M1

M1

[1.558, 1.559] and 1.55

A1

[4]

M2.

285 or $284.\dot{9}$ or 275
or 12.5 or 13.5 or $13.4\dot{9}$
or 18.5 or $18.4\dot{9}$ or 17.5

B1

their 285 as part of trapezium equation

or $\left(\frac{\text{their } 12.5 + \text{their } 17.5}{2}\right)h$

oe ***their*** *285 = (280, 290]* ***their*** *12.5 = [12.5, 13)* ***their*** *17.5 = [17.5, 18)*

M1

$285 = \left(\frac{12.5 + 17.5}{2}\right)h$

oe fully correct

A1

19 with no incorrect bounds used

A1

[4]

M3.

350 or 450 or $449.\dot{9}$

or 24.5 or 25.5 or $25.4\dot{9}$

B1

450 ÷ 24.5 or 18.3(6) or 18.4

or their 450 ÷ their 24.5

Accept (400, 450] for their 450
Accept [24.5, 25) for their 24.5

M1

450 ÷ 24.5 and 18

or $449.\dot{9} \div 24.5$ and 18

A1

Additional Guidance
400 ÷ 25

M0

[3]

M4.(a) 2520 ÷ 126 or 20 or

126 ÷ 2520 or 0.05
oe

M1

44 × their 20 or 44 ÷ their 0.05 or

4960 ÷ their 20 or 4960 × their 0.05

or 880 or 248
oe
M2 *44 ÷ 126 × 2520 or*
4960 ÷ 2520 × 126

M1dep

2520	**880**	**1560**	4960
126	44	**78**	**248**

A1

(b) (minimum) 3785

B1

(maximum) 3794

SC1 *correct answers interchanged*

B1

[5]

M5. 1495 or 1505 or $1504.\dot{9}$ seen

B1

74.5 or 75.5 or $75.4\dot{9}$ seen

B1

$\frac{1495}{75.5}$ or $\frac{1495}{75.4\dot{9}}$

$\frac{\text{their min}[1450,\ 1500)}{\text{their max}\ (75,\ 76]}$

M1

19.8(...)

Must come from the correct calculation

A1

19

Strand (i) Rounding down their answer
ft their 19.8

Q1ft

Alternative Method

74.5 or 75.5 or $75.4\dot{9}$ seen

B1

Any trial correctly evaluated
eg 18 × 75.5 = 1359
M1

19 × 75.5 = 1434.5
Accept 75.49̇
A1

20 × 75.5 = 1510
Accept 75.49̇
A1

19
Strand (i) Lower value
Q1ft
[5]

M6.(a) (175 – 170) × 2 or 10 (firefighters)
or (185 – 175) × 3.8
or (190 – 185) × 6
or (200 – 190) × 1.2 or 12
M1

38 or 30
A1

175 ≤ height
Working needed
SC1 for 175 ≤ height
Condone 175 – 185 or 185 – 175
A1

Alternative method

170 to 175 = 2 or = 50

or 190 to 200 = 2.4 or = 60

Counts squares

M1

7.6 or 6

or

190 (firefighters) or 150

Must be from counting squares

A1

175 ≤ height

or

175 ≤ height

Working needed
SC1 for 175 ≤ height
Condone 175 – 185 or 185 – 175

A1

Additional Guidance

Ignore a slip in calculating the end bar(s) if middle correct

(b) Midpoints seen or implied

172.5, 180, 187.5, 195

Condone one error

B1

their $\sum fx$

10 × 172.5 + 38 × 180 + 30 × 187.5 + 12 × 195

or 1725 + 6840 + 5625 + 2340

or 16 530

Condone one error
ft their midpoints

M1

their $\sum fx \div 90$
their 16 530 ÷ 90

M1 dep

184 or 183.7 or 183.66... or 183.67
Anything less accurate than 2dp requires correct working seen
NB Using heights gives 183.69 and scores B1 only

A1

Alternative method

Midpoints seen or implied

172.5, 180, 187.5, 195
Condone one error

B1

their $\sum fx$

$2 \times 172.5 + 7.6 \times 180 + 6 \times 187.5 + 2.4 \times 195$

or 345 + 1368 + 1125 + 468

or 3306
Condone one error
ft their midpoints

M1

their $\sum fx \div 18$
their 3306 ÷ 18

M1 dep

184 or 183.7 or 183.66... or 183.67

Anything less accurate than 2dp requires correct working seen
NB Using heights gives 183.69 and scores B1 only

A1

Additional Guidance

A repeated consistent error is only one error

(c) One correct bound seen

170.35 or 170.45 or

195.55 or 195.65

195.6 − 170.4 + 0.1

M1

25.3

A1

[9]

M7. 39.5 or 24.5 or 40.5 or 25.5

or 965 or 975

B1

One correctly evaluated trial using at least one bound

or one correctly evaluated trial giving an answer in range 965 to 975

eg 39.5 × 24.5 = 967(.75)
or 39.7 × 24.5 = 972(.65)
or 40.5 × 25.5 = 1032(.75)
Trial values must be in range of bounds

M1

Ticks cannot tell and 965 seen

and

One correctly evaluated trial giving an answer in range 965 to 970

or

Ticks cannot tell and 975 seen

and

One correctly evaluated trial giving an answer in range 970 to 975

eg 967.75
eg 972.6

A1

Alternative method 1

One correctly evaluated trial giving an answer below 970

(or their value [965, 975])

M1

One correctly evaluated trial giving an answer below 970

(or their value [965, 975])

and

One correctly evaluated trial giving an answer above 970

(or their value [965, 975])

M1dep

Ticks cannot tell

and

One correctly evaluated trial giving an answer below 970

(or their value [965, 975])

and

One correctly evaluated trial giving an answer above 970

(or their value [965, 975])

eg 967.75 and 1032.75
or 967.75 and 1000

or 967.75

A1

Additional Guidance

Trial values must be within range of bounds, e.g.
39.5 × 26 = 1027 scores B1M0
25 × 40 = 1000 on its own scores zero but see Alt method 2

[3]

M8.79.5 or 80.5 or

1.35 or 1.45 seen

B1

min shelf [75, 80) ÷ max bottle (1.4, 1.5)

M1

79.5 ÷ 1.45

Condone 1.4499 or better

A1

54

ft answer rounded down if M1A0 awarded

A1ft

[4]

M9.9.5 or 10.5 seen

B1

145 ÷ [10.49, 10.5]

Condone use of 144.5

M1

13.(8095...)

Must be using 145 and 10.5

A1

13

M1 must have been scored
Truncates their answer to nearest integer

B1 ft

Alternative method

9.5 or 10.5 seen

B1

[10.49, 10.5] × integer [10, 13]

and [10.49, 10.5] × integer [14, 20]

Both must be correctly evaluated

M1

10.5 × 13 = 136.5

and 10.5 × 14 = 147

A1

13

M1 must have been scored

B1

[4]

M10.445 and 544

B2 445 or 544

or 450 and 540 or 450 and 549 B1 450 or 540 or 545 or 549

B3

[3]

M11. (a) 12 × 1.5 (= 18) or 8 × 2.5 (= 20)

20 × 2.5 (= 50) or 12 × 1

M1

12 × 1.5 + 8 × 2.5 or 18 + 20

20 × 2.5 − 12 × 1 or 50 − 12

M1 dep

38

A1

(b) 1.82 or 1.815 or 1.825 seen

oe eg sight of 182, 181.5 or 182.5

B1

30 499 999 or 29 500 000 seen or 29.5 (million)

Accept 30 500 000 or 30.5 (million)

B1

$\frac{\text{their max}}{\text{their min}}$

their max > 30 000 000

1 < their min < 1.82

M1

16 804 407 or 16 804 408 or 16 804 410 or 16 804 400 or 16 804 000

Strand (i)

Correct mathematical notation

Must be an integer answer

Accept 16 800 000 or 17 000 000 or 16.8 million or 17 million if first 3 marks awarded

SC3 16 804 407.16 or 16 804 407.71

SC1 [16 483 516, 16 483 517]

Q1

[7]

M12. Possible weight given for **one** of Amy's fish
[6.75, 6.8) or [4.25, 4.3) or [5.15, 5.2)

Any Amy weight could go down (or Kate up) by 0.05

M1

Possible weight given for **one** of Kate's fish
(8.2, 8.25] or (3.4, 3.45] or (4.5, 4.55]

Any 3 Amy weights could go down (or Kate up) by 0.15

M1

5 or 6 of these allowed values

16.3 − 0.15 = 16.15 or 16.1 + 0.15 = 16.25

M1

Totals showing possible
Must have total for Kate > total for Amy

Amy = [16.15, 16.3)

Kate = (16.1, 16.25]

A1

[4]