

THE MEAN

CONTENT DOMAIN REFERENCES:
S3

KS2 SATS

PRACTICE QUESTIONS BY TOPIC

1 Here are **three** numbers.

[Extra]

4 8 9

Show that the mean of these numbers is 7

$$\frac{4 + 8 + 9}{3} = \frac{21}{3}$$
$$= \underline{7}$$

[2 marks]

2 Here are **three** numbers.

[Extra]

7 8 3

Work out the mean of these numbers.

Show your method

$$\frac{7 + 8 + 3}{3} = \frac{18}{3}$$
$$= \underline{6}$$

6

[2 marks]

3

Seven children measured their heights.

[2016S]

Children	Height (cm)
Stefan	144
Lara	136
Olivia	142
Chen	143
Maria	152
Dev	148
Sarah	150

$$\begin{array}{r} 1015 \\ 32 \end{array}$$

What is the mean height of the children?

Show your method

$$\frac{144 + 136 + \dots + 150}{7}$$

$$= \frac{1015}{7} = \underline{\underline{145}}$$

145

[2 marks]

4

Two numbers have a mean of 12

[Extra]

One of the numbers is 9

$$\rightarrow \text{TOTAL} = 2 \times 12 = \boxed{24}$$

What is the other number?

Show your method

$$\text{TOTAL} = 24$$

$$24 - 9 = \underline{\underline{15}}$$

15

[2 marks]

5

Three numbers have a mean of 13

TOTAL = 3 x 13 = 39

[Extra]

Two of the numbers are 8 and 12

What is the other number?

Show your method

$$39 - (8 + 12)$$

$$= 39 - 20$$

$$= \underline{\underline{19}}$$

19

[2 marks]

6

The mean of three numbers is 5

TOTAL = 3 x 5 = 15

[Extra]

One of these numbers is 2

What could the other numbers be?

Write them on the cards below.

ANY TWO NUMBERS THAT ADD TO 13!

2



1

12

What else could the numbers be?

Use **different numbers** from your answer above.

Write them on the cards below.

2



6

7

[2 marks]

7

Hanif asked ten people:

[Extra]

'What is your favourite sport?'

Here are his results.

football	cricket	football	hockey	swimming
hockey	swimming	football	netball	football

Is it possible to work out the **mean** of these results?

Yes

No

Explain how you know.

IT IS ONLY POSSIBLE TO FIND THE MEAN OF A SET OF NUMBERS AND THESE RESULTS ARE WORDS!

[1 mark]

8

Three positive whole numbers are all different.

[Extra]

The mean of the numbers is 4 ——— TOTAL = $3 \times 4 = 12$

One of the numbers is 5

Find the other two numbers.

Show your method

$12 - 5 = 7$ [so TOTAL OF MISSING NUMBERS IS 7]

OPTIONS

$1 + 6$

$2 + 5$ ← NOT POSSIBLE BECAUSE ALL THE NUMBERS MUST BE DIFFERENT!

$3 + 4$

1 AND 6

MUST BE DIFFERENT! [OR 3 AND 4]

[2 marks]

9

Four numbers have a mean of 24

$$\rightarrow \text{TOTAL} = 4 \times 24 = 96$$

[Extra]

Three of the numbers are 22, 36 and 9

What is the other number?

Show your method

$$22 + 36 + 9 = 67$$

$$\begin{array}{r} 96 \\ - 67 \\ \hline 29 \end{array}$$

29

[2 marks]

10

Four numbers have a mean of 17

$$\rightarrow \text{TOTAL} = 4 \times 17 = 68$$

[Extra]

One of the numbers is 8.

The other three numbers are the same. What are they?

Show your method

$$68 - 8 = 60$$

$$\frac{60}{3} = \underline{\underline{20}}$$

20

[2 marks]

11

The mean age, in years, of Ahmed, George and Chloe is 21

$$\rightarrow \text{TOTAL} = 3 \times 21$$

[Extra]

The mean age, in years, of Ahmed and George is 19

$$\rightarrow \text{TOTAL} = 2 \times 19 = 38$$

$$= 63$$

Work out Chloe's age.

Show your method

$$\begin{array}{r} 63 \\ - 38 \\ \hline 25 \end{array}$$

25

[2 marks]

12

A person must be 1.40 metres, or taller, to ride on Nemesis in Alton Towers.

[Extra]

The mean (average) height of Tommy and his friends is 1.50 metres.

Tommy says

"We are all allowed to ride on Nemesis"

Explain why Tommy might be wrong.

SOME PEOPLE WILL BE SHORTER THAN THE MEAN. ONE OF THEM MIGHT BE LESS THAN 140 CM, BUT THE MEAN IS 1.50 METRES BECAUSE OF A VERY TALL PERSON 'BALANCING OUT' THE SHORT PERSON

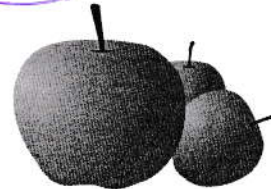
[1 mark]

13

Three apples have a mean (average) mass of 100 grams.

[Extra]

$$\text{TOTAL} = 300\text{g}$$



The largest apple is removed.

The mean mass of the remaining two apples is 70 grams.

$$\text{TOTAL} = 140\text{g}$$

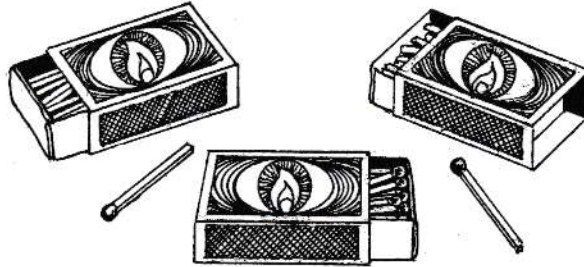
What is the mass of the largest apple?

Show your method

$$\begin{array}{r} 300 \\ - 140 \\ \hline 160 \end{array}$$

160g

[2 marks]



Carol counts the matches in **10 boxes.**

She works out that the **mean** number of matches in a box is **51**

Here are her results for **9 boxes.**

Number of matches in a box						
48	49	50	51	52	53	54
	✓	✓	✓	✓		✓
	✓	✓				✓
	✓					

$$\begin{aligned} \text{TOTAL} &= 10 \times 51 \\ &= 510 \end{aligned}$$

Calculate how many matches are in the **10th box.**

Show your method

$$(49 \times 3) + (50 \times 2) + 51 + 52 + (54 \times 2)$$

$$= 147 + 100 + 103 + 108$$

$$= 458$$

52

$$\begin{array}{r} 510 \\ - 458 \\ \hline 52 \end{array}$$

[2 marks]

15

Five numbers have a mean of 6

[Extra]

Four of the numbers are shown:

$$\text{TOTAL} = 5 \times 6 = 30$$

9	7	4	7
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Work out the value of the missing number.

Show your method

$$9 + 7 + 4 + 7 = 27$$

$$30 - 27 = \underline{\underline{3}}$$

3

[2 marks]

16

The mean height of a group of 4 girls is 164 cm.

[Extra]

What is the total height of the 4 girls?

$$\begin{array}{r} 164 \\ \times 4 \\ \hline 656 \\ \hline \end{array}$$

656 cm

Anika joins the group and the mean height of the 5 girls is 166 cm.

How tall is Anika?

Show your method

NEW TOTAL

$$\begin{array}{r} 166 \\ \times 5 \\ \hline 830 \\ \hline \end{array}$$

$$\begin{array}{r} 830 \\ - 656 \\ \hline 174 \\ \hline \end{array}$$

174 cm

[3 marks]

17

Megan goes on a walking holiday for five days.

[Extra]

The table shows how far she walked on the first four days.

Monday	Tuesday	Wednesday	Thursday
14km	23km	13km	13km

Megan says,

'My average for the first four days is more than 15km.'

Explain why Megan is correct.

$$14 + 23 + 13 + 13 = \underline{\underline{63}}$$

IF AVERAGE FOR FOUR DAYS WAS 15
THE TOTAL WOULD BE
JUST $4 \times 15 = 60!$

Friday is her last day.

She wants to increase her average to **17km**

$$\rightarrow \text{TOTAL} = 5 \times 17 = \boxed{85}$$

How many kilometres must she walk on Friday?

Show your method

$$\text{TOTAL AFTER 4 DAYS} = 63$$

SHE NEEDS TO WALK

$$85 - 63 = \underline{\underline{22}} \text{ km}$$

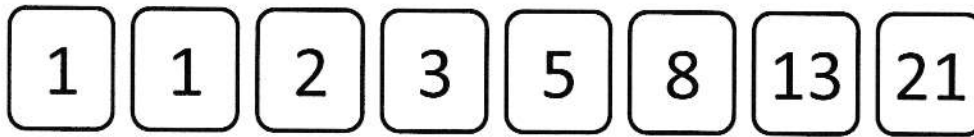
22 km

[3 marks]

18

Here are some cards with numbers on them.

[Extra]

Choose **three** numbers which have a mean of 4 \rightarrow TOTAL = 121, 3 and 8Choose **four** numbers which have a mean of 4 \rightarrow TOTAL = 161, 2, 5 and 8Choose **five** numbers which have a mean of 4 \rightarrow TOTAL = 201, 1, 2, 3 and 13

[3 marks]

19

A, B and C stand for three different numbers.

[2002]

The mean of A and B is 40 \rightarrow TOTAL = 80The mean of B and C is 35 \rightarrow TOTAL = 70

$$A + B + C = 100$$

Calculate the values of A, B and C.

Show your method

1ST $\left. \begin{array}{l} A + B + C = 100 \\ A + B = 80 \end{array} \right\} C = \underline{\underline{20}}$

2ND $B + \overset{[20]}{C} = 70 \Rightarrow B = \underline{\underline{50}}$

3RD $A + \overset{[50]}{B} + \overset{[20]}{C} = 100 \Rightarrow A = \underline{\underline{30}}$

A	B	C
30	50	20

[2 marks]

20

[Extra]

Set A has 3 numbers with a mean of 10 \rightarrow TOTAL = 30
 Set B has 5 numbers with a mean of 18 \rightarrow TOTAL = 90

The two sets are combined.

What is the mean of all 8 numbers?

Show your method

$$\frac{30 + 90}{8} = \frac{120}{8}$$

$$= \underline{\underline{15}}$$

15

[2 marks]

21

[Extra]

The mean height of a group of 5 children is 164 cm. \rightarrow TOTAL = 820

One child, whose height is 156 cm, leaves the group.

Find the mean height of the remaining 4 children.

Show your method

$$\begin{array}{r} 820 \\ - 156 \\ \hline 664 \end{array} \rightarrow \frac{664}{4} = \frac{332}{2} = \underline{\underline{166}}$$

166 cm

[2 marks]

22

[Extra]

After 4 tests, Zoe's mean mark is 66% \rightarrow TOTAL = $4 \times 66 = 264$

Zoe takes another test.

What score must Zoe get to increase her mean score in all 5 tests to 70%?

Show your method

ZOE NEEDS

$$5 \times 70 = 350$$

$$\begin{array}{r} 350 \\ - 264 \\ \hline 86 \end{array}$$

86

[NOTE THE ASSUMPTION THAT ALL TEST HAD THE SAME MAXIMUM MARK!]

[2 marks]

Altogether, I have **10** bags of sweets.

[Extra]

The **mean** number of sweets in the bags is **41** → TOTAL = **410**

The table shows how many sweets there are in **9** of the bags.

Number of sweets in a bag	Frequency
39	3
40	2
41	1
42	1
43	0
44	2

Calculate how many sweets there are in the 10th bag.

Show your method

$$(39 \times 3) + (40 \times 2) + 41 + 42 + (44 \times 2)$$

$$= 117 + 80 + 41 + 42 + 88$$

$$= \underline{368} \quad \boxed{42}$$

$$\begin{array}{r} 410 \\ - 368 \\ \hline 42 \end{array}$$

[2 marks]