Reverse Mean

SCAN ME

REVISE THIS TOPIC

1 Seven positive numbers have a mean of 5.

Six of the numbers are 2 2 3 5 7 10

Work out the other number.

$7 \times 5 = 35$

$2 + 2 + 3 + 5 + 7 + 10 = 29$

$35 - 29 = 6$

6

(Total for Question 1 is 3 marks)

2 Six positive numbers have a mean of 20.

Five of the numbers are 13 14 20 20 35

Work out the median of all six numbers.

$6 \times 20 = 120$

$13 + 14 + 20 + 20 + 35 = 102$

$120 - 102 = 18$

~~13~~ ~~14~~ 18 20 ~~20~~ ~~35~~

19

(Total for Question 2 is 4 marks)

3 Pamai completes tests in Maths, English, Science, History, Geography and Spanish.
The table below shows Pamai's test scores in five of her subjects.

Subject	Maths	English	Science	History	Geography
Test Score (%)	82	57	84	63	77

For all six subjects Pamai's mean score is 72%
Work out Pamai's test score in Spanish.

$6 \times 72 = 432$
$82 + 57 + 84 + 63 + 77 = 363$
$432 - 363 = 69$

69 .....%

(Total for Question 3 is 3 marks)

4 A football team recorded how many goals they scored in their first 8 matches of a season.

The table below shows the number of goals scored for the first 7 of those games.

Game Number	1	2	3	4	5	6	7
Goals Scored	3	1	1	0	1	0	2

The mean number of goals scored for all 8 games was 1.5

Work out the number of goals scored in the 8th game.

$8 \times 1.5 = 12$
$3 + 1 + 1 + 0 + 1 + 0 + 2 = 8$
$12 - 8 = 4$

4 .....

(Total for Question 4 is 3 marks)

5 The mean age of 9 members at a running club is 25 years.

A new member joins the club and the mean age increases to 26 years.

Work out the age of the new member of the running club.

$9 \times 25 = 225$

$10 \times 26 = 260$

$260 - 225 = 35$

35

(Total for Question 5 is 3 marks)

6 The mean weekly pay of 4 workers at a company is £600.

A new worker joins the company and is paid £700 per week.

Work out the new mean pay of all workers at the company.

$4 \times 600 = 2400$

$2400 + 700 = 3100$

$3100 \div 5 = 620$

£ 620

(Total for Question 6 is 3 marks)

7 Six positive numbers have

a mean of 29
a range of 21

Four of the numbers are 19 21 35 37 40

Work out the other two numbers.

$19 + 21 = 40$

$6 \times 29 = 174$

$19 + 21 + 35 + 37 + 40 = 152$

$174 - 152 = 22$

40 , 22

(Total for Question 7 is 3 marks)

8 Seven positive numbers have

a mean of 12
a median of 13
a mode of 14

Four of the numbers are 8 10 14 19

Work out the range of the seven numbers.

6 8 10 13 14 14 19

13 ↑ median, 14 ↑ mode

$7 \times 12 = 84$

$8 + 10 + 13 + 14 + 14 + 19 = 78$

$84 - 78 = 6$

$19 - 6 = 13$

13

(Total for Question 8 is 4 marks)

9 Rachel recorded the temperature in her town on each day for 1 week.

The mean temperature for the 5 days from Monday to Friday was 11°C
The mean temperature for all 7 days was 13°C

On Saturday, the temperature was 21°C
Work out the temperature for Sunday.

$5 \times 11 = 55$
$7 \times 13 = 91$
$91 - 55 = 36$
$36 - 21 = 15$

15 ..... °C

(Total for Question 9 is 4 marks)

10 15 students complete a maths test.
The mean score of all 15 students is 71%

One of the students is found to have cheated in the test.
The score of the student who cheated is removed and the mean score of the remaining students is 69%

Work out the test score of the student who cheated in the test.

$15 \times 71 = 1065$
$14 \times 69 = 966$
$1065 - 966 = 99$

99 ..... %

(Total for Question 10 is 3 marks)

11 The mean mass of Mercury, Earth and Mars is 2.3×10^{24} kg
The mean mass of Mercury, Earth, Mars and Venus is 2.95×10^{24} kg

Work out the mass of Venus.
Give your answer in standard form.

$2.3 \times 10^{24} \times 3 = 6.9 \times 10^{24}$
$2.95 \times 10^{24} \times 4 = 11.8 \times 10^{24}$
$11.8 \times 10^{24} - 6.9 \times 10^{24} = 4.9 \times 10^{24}$

4.9×10^{24} kg

(Total for Question 11 is 3 marks)

12 From Monday to Thursday the mean amount of time it took Ryan to travel to work was 35 minutes.
On Friday there are roadworks on Ryan's route to work.

The mean amount of time it took Ryan to get to work from Monday to Friday was 44 minutes.
On Friday Ryan left his house at 7:45 am. He must arrive to work by 9:00 am.

Show clearly that Ryan was late to work.
You must show all your working.

$35 \times 4 = 140$
$44 \times 5 = 220$
$220 - 140 = 80$ mins
$= 1$h 20 mins
$7{:}45 + 1$h $20 = 9{:}05$ am
Ryan is 5 minutes late

(Total for Question 12 is 4 marks)

13 In a class there are 15 males and 12 females

The mean height of the males is 172 cm
The mean height of the females is 163 cm

Work out the mean height for all of the students in the class.

15 x 172 = 2580
12 x 163 = 1956
2580 + 1956 = 4536
4536 ÷ 27 = 168

168 cm

(Total for Question 13 is 3 marks)

14 A theme park wants to ensure that the mean amount of time spent queuing for rides is less than 1 hour.

On Friday, Saturday and Sunday some visitors were asked how long they queued for a ride.

Day	Friday	Saturday	Sunday
Number of visitors asked	155	200	187
Mean time spent queuing (minutes)	54	66	58

Show clearly that the mean amount of time spent queuing for all visitors asked on Friday, Saturday and Sunday was less than 1 hour.

155 x 54 = 8370
200 x 66 = 13200
187 x 58 = 10846
8370 + 13200 + 10846 = 32416
155 + 200 + 187 = 542
32416 ÷ 542 = 59.8 mins (< 60 mins)

(Total for Question 14 is 4 marks)

15 A film trilogy contains 3 films.
The mean length of films in the trilogy is 1 hour 47 minutes

The first film is 1 hours 54 minutes long
The second film is 1 hour 22 minutes long

Work out the length of the third film.
Give your answer in hours and minutes.

1h 47 = 107 mins
107 x 3 = 321
1h 54 = 114 mins
1h 22 = 82 mins
321 - 114 - 82 = 125 mins

2 hours 5 minutes

(Total for Question 15 is 4 marks)

16 In a garden there are 50 rose plants and 45 tulip plants.

The mean height of the rose plants is 40 cm
The mean height of the tulip plants is 21 cm

Work out the mean height of all plants in the garden

50 x 40 = 2000
45 x 21 = 945
2000 + 945 = 2945
50 + 45 = 95
2945 ÷ 95 = 31

31 cm

(Total for Question 16 is 3 marks)

17 A vet is caring for 6 cats and 5 dogs.

The mean mass of the 5 dogs is 13.3 kg
The mean mass of all the cats and dogs is 7.9 kg

Work out the mean mass of the 6 cats.

$5 \times 13.3 = 66.5$
$11 \times 7.9 = 86.9$
$86.9 - 66.5 = 20.4$
$20.4 \div 6 = 3.4$

3.4 kg

(Total for Question 17 is 3 marks)

18 In a class there are 18 males and 12 females

The students all complete a test with a maximum score of 40 marks.

The mean mark for the male students is 27
The mean mark for the female students is 34

The teacher will reward the students if the mean mark for all students is greater than 75% of the maximum score.

Show clearly that the teacher will not reward the students.

$18 \times 27 = 486$
$12 \times 34 = 408$
$486 + 408 = 894$
$894 \div 30 = 29.8$
$\frac{29.8}{40} \times 100 = 74.5\%$ $(<75\%)$

(Total for Question 18 is 4 marks)

19 An officer recorded the mean speed of 30 cars and 20 lorries on a motorway.

The mean speed of the cars was 68 mph
The mean speed of all of the vehicles was 62 mph

Work out the mean speed of the lorries.

$30 \times 68 = 2040$
$50 \times 62 = 3100$
$3100 - 2040 = 1060$
$1060 \div 20 = 53$

53 ..... mph

(Total for Question 19 is 3 marks)

20 A teacher asked 20 Year 9 students, 30 Year 10 students and 25 Year 11 students how long they spent on their homework.

The mean amount of time spent on homework by Year 9 students was 26 minutes
The mean amount of time spent on homework by Year 10 students was 31 minutes
The mean amount of time spent on homework by all students was 32 minutes

Work out the mean amount of time spent on homework by Year 11 students.

$20 \times 26 = 520$
$30 \times 31 = 930$
$75 \times 32 = 2400$
$2400 - 930 - 520 = 950$
$950 \div 25 = 38$

38 ..... minutes

(Total for Question 20 is 3 marks)

21 6 athletes compete in a 100 metre race with a mean race time of 12.1 seconds.

The race times for 5 of the athletes are shown below.

Athlete	Jason	Zach	Billy	Trini	Kimberley
Time (seconds)	11.6	12.1	13.1	12.2	11.9

Tommy also competed in the race and claims that he was the winner.
Show clearly that Tommy is incorrect.

$6 \times 12.1 = 72.6$

$11.6 + 12.1 + 13.1 + 12.2 + 11.9 = 60.9$

$72.6 - 60.9 = 11.7$ seconds

$11.6 < 11.7$ (Tommy was 2nd place)

(Total for Question 21 is 4 marks)

22 A basketball team plays 18 games in a season.

In September the team plays 8 games
In October the team plays 4 games.
In November the team plays 6 games.

The mean number of points scored by the team in September is 71.
The mean number of points scored by the team in September and October is 74.
The mean number of points scored by the team in November is the same as the mean number of points scored in October.

Work out the total number of points the team scores during the entire season.

$8 \times 71 = 568$ (Sept)

$12 \times 74 = 888$

$888 - 568 = 320$ (Oct)

$320 \div 4 = 80$ point per game

$80 \times 6 = 480$ (Nov)

$568 + 320 + 480 = 1368$ 1368

(Total for Question 22 is 4 marks)

23 A bag contains

55	2p coins
16	5p coins
9	10p coins

80 coins

110p ← 80p ← 90p

110 + 80 + 90 = 280

Jordan adds more 5p coins to the bag until the mean value of the coins in the bag is 4p
Work out how many 5p coins Jordan adds to the bag.

$$\frac{5x + 280}{x + 80} = 4$$

$$5x + 280 = 4x + 320$$

$$5x - 4x = 320 - 280$$

$$x = 40$$

40

(Total for Question 23 is 4 marks)

24 Bag A, bag B and bag C each contain only blue and red counters.

Bag A contains 5 red counters and 3 blue counters.
Bag B contains 10 red counters and 4 blue counters.

The mean number of red counters in all three bags is 6.
The mean number of blue counters in all three bags is 5.

Work out the probability that a counter randomly selected from bag C is red.

$6 \times 3 = 18$

$18 - 5 - 10 = 3$ ↑ 3 red

$5 \times 3 = 15$

$15 - 3 - 4 = 8$ ↑ 8 blue

$\frac{3}{11}$

(Total for Question 24 is 4 marks)

25 Adam tracked how many minutes he spent on social media each day from Monday to Friday.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Time spent on social media (minutes)	x	40	185	105	70

The mean amount of time he spent on social media from Monday to Friday was 30% greater than the mean amount of time he spent on social media for Monday and Tuesday.

Work out how many minutes Adam spent on social media on Monday.

$$\frac{x+40+185+105+70}{5} \quad (M \to F)$$

$$= \frac{x+400}{5} \qquad \frac{x+40}{2} \quad (M \to Tu)$$

$$\frac{x+400}{5} = \frac{13}{10}\left(\frac{x+40}{2}\right)$$

$$\frac{x+400}{5} = \frac{13x+520}{20}$$

$$20x+8000 = 65x+2600$$

$$5400 = 45x$$

$$x = \frac{5400}{45}$$

120 ..... minutes

(Total for Question 25 is 4 marks)