

A Combined Mean

- 2 This is a list of 8 numbers.

11 7 8 13 7 14 15 5

- (a) Find the median. 5, 7, 7, 8, 11, 13, 14, 15

$$\frac{8+11}{2} = 9.5 \quad \underline{\quad 9.5 \quad} [2]$$

- (b) An extra number is added to the list.
The mean of the nine numbers is 1 more than the mean of the eight numbers.

Find the ninth number.

mean of eight numbers:

$$\frac{11+7+8+13+7+14+15+5}{8} = \frac{80}{8} = 10$$

mean of nine numbers:

$$10+1 = 11$$

$$\frac{\text{total of nine numbers}}{9} = 11$$

$$\text{total} = 99$$

$$\text{ninth number} = 99 - 80$$

$$= 19 \quad \underline{\quad 19 \quad} [3]$$

- (b) Paulo's mean mark for 7 homework tasks is 17.
After completing the 8th task, his mean mark is 17.5.

Calculate Paulo's mark for the 8th task.

Total of 7 HW tasks:

$$7 \times 17 = 119$$

8th task:

$$140 - 119 = 21$$

Total of 8 HW tasks:

$$8 \times 17.5 = 140$$

$$\underline{\quad 21 \quad} [3]$$

- 8 The mean of eight numbers is 25.
When two extra numbers are included the mean of the ten numbers is 24.

Find the mean of the two extra numbers.

Total of eight numbers:

$$8 \times 25 = 200$$

Sum of two extra numbers:
 $240 - 200 = 40$

mean of these two:

$$\frac{40}{2} = 20 \quad \underline{\quad 20 \quad} [2]$$

Total of ten numbers:

$$10 \times 24 = 240$$

- 7 5 numbers have a mean of 12.
When a 6th number is included the mean is 9.

Work out the 6th number.

Total of 5 numbers:

$$5 \times 12 = 60$$

Total of 6 numbers:

$$6 \times 9 = 54$$

6th number:

$$54 - 60 = -6$$

..... -6 [2]

- 6 The mean of 5 numbers is 12.
The mean of 3 of these numbers is 8.

Find the mean of the other two numbers.

Total of 3 numbers:

$$3 \times 8 = 24$$

Total of 5 numbers:

$$5 \times 12 = 60$$

Total of other two numbers:

$$60 - 24 = 36$$

Mean of these two:

$$\frac{36}{2} = 18$$

..... 18 [3]

- 11 (a) The range of ten numbers is 30.
The range of eight other numbers is 13.

Find the smallest possible value of the range of all eighteen numbers.

For example, the first ten could range from 0 to 30.

For the range to be as small as possible

all eight other numbers would be between 0 and 30 too:

$$30 - 0 = \underline{30} \quad [1]$$

- (b) The mean of twelve numbers is 25.
The mean of ten of these numbers is 16.

Find the mean of the other two numbers.

Total of 10 numbers:

$$10 \times 16 = 160$$

Total of 12 numbers:

$$12 \times 25 = 300$$

Total of other two numbers:

$$300 - 160 = 140$$

Mean of these two:

$$\frac{140}{2} = 70$$

70

[2]

- 10 Aisha picks three number cards from a pack.

The mean of the three numbers is $6\frac{1}{3}$.

She picks another card from the pack.

The mean of the four numbers is $6\frac{1}{2}$.

Work out the number on the fourth card.

Total of three numbers:

$$3 \times 6\frac{1}{3} = 19$$

Total of four numbers:

$$4 \times 6\frac{1}{2} = 26$$

Number on fourth card:

$$26 - 19 = 7$$

7

[3]