Mental methods

- Adding and subtracting numbers mentally
- Multiplying numbers mentally
- Testing for divisibility
- Dividing numbers mentally

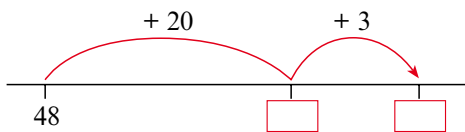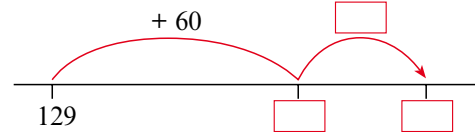Keywords

You should know

explanation 1a   explanation 1b

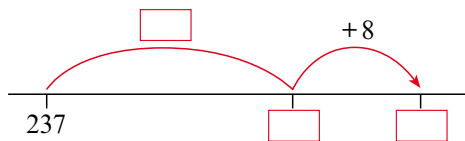**1** Copy these diagrams. Fill in the missing values.

a $48 + 23 = 48 + 20 + 3 = \square$
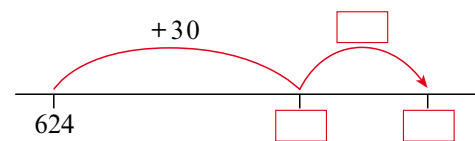
$+20$ $+3$

48

b $129 + 64 = 129 + 60 + = \square$

$+60$

129

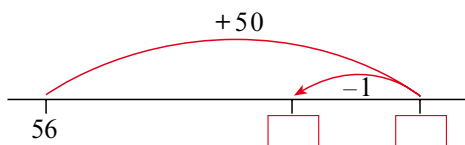**c** $237 + 48 = 237 + \square + 8 = \square$

$+8$

237

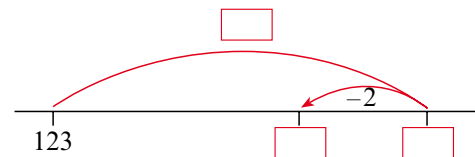**d** $624 + 37 = 624 + 30 + \square = \square$

$+30$

624

2 Copy these diagrams. Fill in the missing values.
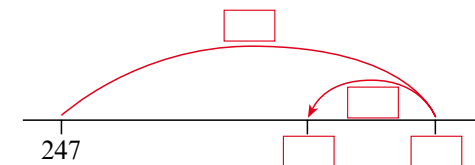
a $56 + 49 = 56 + 50 - 1 = \square$

$+50$

-1

56

b $123 + 58 = 123 + \square - 2 = \square$

-2

123

c $248 + 37 = 248 + 40 - \square = \square$

$+40$

248
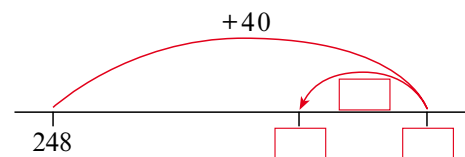
d $247 + 78 = 247 + \square - \square = \square$

247

3 Work these out.

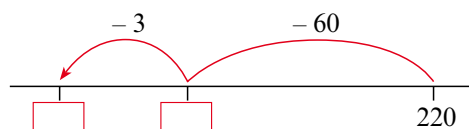|		
a 37 + 54	**b** 65 + 38	**c** 86 + 57
d 42 + 69	**e** 37 + 44	**f** 48 + 29
g 126 + 73	**h** 217 + 68	**i** 329 + 99
j 485 + 88	**k** 372 + 57	**l** 458 + 139

4 Copy the diagrams. Fill in the missing values.

a $220 - 63 = 220 - 60 - 3 = \square$

-3 -60

$\square$ $\square$ 220

b $473 - 149 = 473 - 150 + 1 = \square$

-150

$+1$

$\square$ $\square$ 473

c $318 - 54 = 318 - \square - 4 = \square$

-4 $\square$

$\square$ $\square$ 318

d $567 - 138 = 567 - \square + 2 = \square$

$\square$

$+2$

$\square$ $\square$ 567
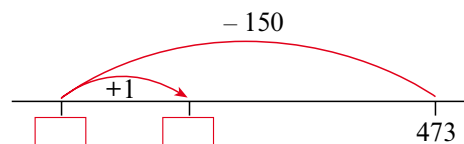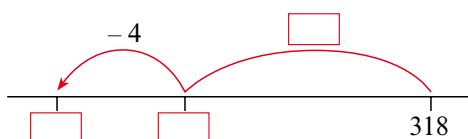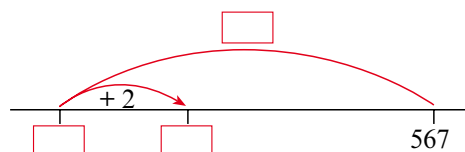
5 Work these out.

a 123 − 51	**b** 118 − 34	**c** 143 − 29
d 160 − 78	**e** 225 − 49	**f** 232 − 56
g 170 − 97	**h** 318 − 67	**i** 425 − 89
j 261 − 178	**k** 625 − 119	**l** 732 − 216

6 Joe buys a drink and an apple from the canteen.

a How much money does he spend?

b How much change would he get from £1?

Drinks   48p
Sandwiches   85p
Fruit   36p
              each

7 In Maria's class there are 34 pupils. 18 of the pupils are boys.
How many are girls?

8 Siobhan bought a skirt for £37 and a jacket for £58. How much money did she spend?

9 There are 230 pupils in a school. 178 of the pupils went on the French trip. How many of the pupils didn't go on the trip?

10 Pravinder lost 18 marks out of 95 on a test.

What was Pravinder's test score?

11 Copy and complete.

a $37 + \square = 100$ b $53 + \square = 100$ c $79 + \square = 100$

d $436 + \square = 1000$ e $874 + \square = 1000$ f $718 + \square = 1000$

12 Work these out.

a $100 - 68$ b $100 - 41$ c $100 - 36$

d $1000 - 327$ e $1000 - 579$ f $1000 - 193$

13 Copy and complete. Each number in a rectangle is the sum of the numbers in the circles on either side.

a
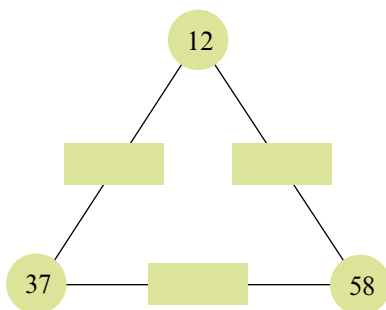
b
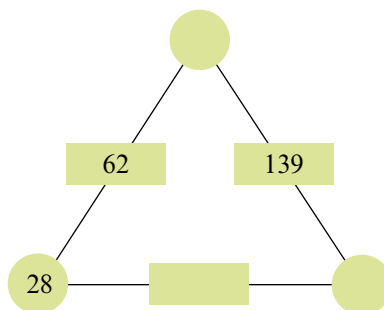
c

d

14 Double these numbers.

    a 12   **b** 35   **c** 27

    d 49   **e** 152   **f** 128

15 Find half of these numbers.

    a 80   **b** 70   **c** 48

    d 62   **e** 32   **f** 54

16 Work these out.

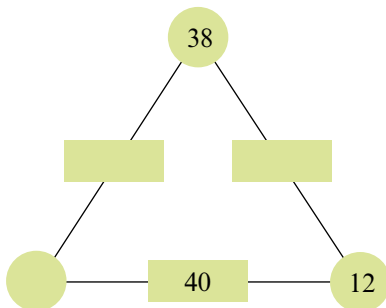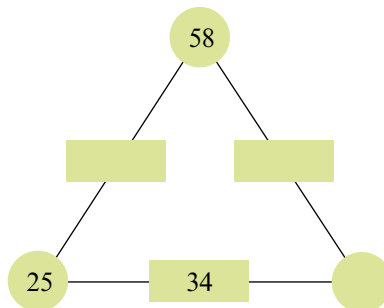   **a** 3×5 **b** 7×4 **c** 8×8

    d 6×4 **e** 5×8 **f** 9×6

    g 7×7 **h** 9×3 **i** 8×3

    j 5×4 **k** 6×6 **l** 2×9

> explanation 2

17 These calculations show some different ways to partition a multiplication.

Copy and complete.

    a $43 \times 6 = (40 \times 6) + (\square \times 6)$ **b** $39 \times 7 = (40 \times 7) - (\square \times 7)$

               $= \square + \square$ $= \square - \square$

               $= \square$ $= \square$

    c $37 \times 11 = (37 \times 10) + (37 \times \square)$ **d** $58 \times 9 = (58 \times 10) - (58 \times \square)$

               $= \square + \square$ $= \square - \square$

               $= \square$ $= \square$

18 Use partitioning to work these out mentally.

    a 23×8 **b** 99×7 **c** 6×54

    d 72×11 **e** 81×99 **f** 125×13

    g 63×12 **h** 198×3 **i** 142×18

explanation 3

19 Work out these multiplications by using factors.

a $25 \times 36 = (25 \times 4) \times 9$
  $= \square \times \square$
  $= \square$

b $15 \times 24 = (15 \times 4) \times 6$
  $= \square \times \square$
  $= \square$

c $45 \times 12 = (45 \times 2) \times \square$
  $= \square \times \square$
  $= \square$

d $15 \times 16 = (15 \times 2) \times \square$
  $= \square \times \square$
  $= \square$

e $25 \times 30 = (25 \times 3) \times \square$
  $= \square \times \square$
  $= \square$

f $50 \times 18 = (50 \times 2) \times \square$
  $= \square \times \square$
  $= \square$

20 Use the method of multiplying in stages to work these out.

a 25×16
b 21×15
c 16×6

d 125×8
e 25×12
f 75×12

g 25×24
h 75×40
i 32×20

21 You are told this result: $4 \times 9 = 36$.

a Use the result to work out $36 \div 9$.

b Use the result to work out 4×18.

22 You are told this result: $8 \times 7 = 56$.

a Use the result to work out $56 \div 8$.

b Use the result to work out 8×14.

23 You are told this result: $18 \times 48 = 864$.

a Use the result to work out $432 \div 48$.

b Use the result to work out 18×24.

explanation 4

24 Oliver worked out 234 × 5 to be 1107.

Explain how you know his answer cannot be correct. Do not do the calculation.

25 Copy and complete this table. The first row has been done for you.

Number	Is the number divisible by...						
	2?	3?	4?	5?	6?	9?	10?
12	✓	✓	✓	✗	✓	✗	✗
18							
27							
45							
72							
120							

26 a Which of these numbers are divisible by 3?

1467   2513   8215   7324   6543   5437

b Are any of the numbers in part **a** divisible by 6?
Explain your answer.

27 A whole number is divisible by 15 if it is divisible by 3 and 5.

Only one of the numbers below is divisible by 15. Which number is it?

42368   76542   97650   86735   65874   98124   31576

28 Write down a 3-digit number divisible by

a 3   **b** 4   **c** 6   **d** 15