Workbook answers

Exercise 1.1

1 a −7 b 1 c −5 d 5

2 a −2 b −9 c 9 d 1

3

+	4	−5
2	6	−3
−6	−2	−11

4 a 15 b −25 c −15 d 17

5 a 25 b 5 c 11 d −23

6 a −7 b 6 c 4 d −10

7 a 9 b 5 c 2 d −3

8 a 4 b 17 c −20 d 6

9 a −80 b 200 c −800 d −90

10 −6

11 Two possible answers: −2 or 4.

12 a $-3 + 4 = 1$ b $-5 + 3 = -2$

c $5 + -2 = 3$

13

+	3	−4
2	5	−2
−2	1	−6

14

−	−4	6	2
3	7	−3	1
−3	1	−9	−5

15 a

−1
1 −2
−3 4 −6

b

−1
3 −4
6 −3 −1

16

−6
−2 −4
5 −7 3

One method is to try different numbers in the bottom square. Try to get closer to −6 each time.

Exercise 1.2

1 a −30 b −36 c −55 d −49

2 a −12 b −4 c −5 d −7

3

×	4	7
−2	−8	−14
−6	−24	−42

4 a −12 b −30 c −28 d −30

5 a −3 b −7 c −2 d −6

6 a −8 b −3 c 13 d 5

7 a 9 b −4 c −36 d 32

8 a −12 b 21 c 8 d −3

9 a −1200 b −900 c −1200 d −200

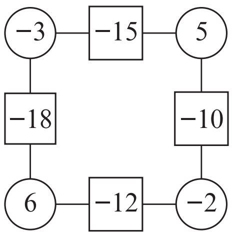
10 a −2 and 9; 3 and −6; −3 and 6; 1 and −18; −1 and 18

b There are two more, as listed in part a.

11

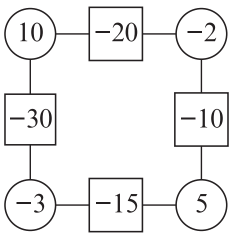
×	6	4
−5	−30	−20
−8	−48	−32

12 a i



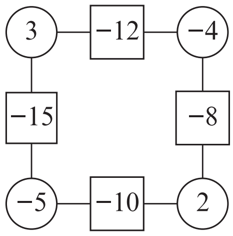
ii −55

b i

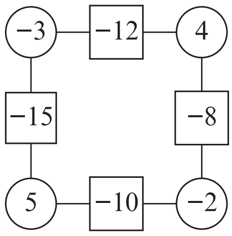


ii −75

13 a



or



b There are two solutions.

14 a $(3 + -5) \times 4$ or $(-5 + 3) \times 4$

b $(-4 + 7) \times 2 = 6$. The other possibilities are negative numbers.

15 a -1 and 20 have a sum of 19.

b -1 and 30 have a sum of 29.

c For any negative integer, the largest possible sum is the corresponding positive integer -1. For example: For -15, the largest sum is $15 - 1 = 14$.

Exercise 1.3

1 a 4, 8, 12, 16 **b** 7, 14, 21, 28

c 12, 24, 36, 48 **d** 30, 60, 90, 120

2 9

3 a 8, 16, 24, 32, 40, 48

b 5, 10, 15, 20, 25, 30, 35, 40, 45

c 40

4 a 6, 12, 18, 24, 30 **b** 6 **c** 6

5 a 12, 24, 36 **b** 12 **c** 12

6 a 30 **b** 20 **c** 10

7 The multiples of 3 are 3, 6, 9, 12, 15, . . . The multiples of 5 are 5, 10, 15, . . . So 15 is the lowest common multiple and the multiples of 15 are common multiples.

8 42

9 a i 14 **ii** 28 **iii** 42

b Multiply the two numbers.

c It works unless the other number is a multiple of 7. For example: it works for 7 and 8, or 7 and 9, or 7 and 10, but not for 7 and 14, or 7 and 21.

10 a i 90 **ii** Yes

b i 98 **ii** No; the LCM is 14.

c i 96 **ii** No; the LCM is 24.

11 30

12 72

13 a Because $96 \div 4 = 24$ and $96 \div 24 = 4$.

b No; the LCM is 24 because $24 = 6 \times 4$.

14 5 and 9

15 1 and 63; 7 and 9

Exercise 1.4

1 a 1, 3, 7, 21 **b** 1, 2, 4, 8, 16, 32

c 1, 2, 5, 10, 25, 50

d 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

e 1, 43

2 a 1, 3, 17, 51 **b** 1, 2, 4, 13, 26, 52

c 1, 53 **d** 1, 2, 3, 6, 9, 18, 27, 54

e 1, 5, 11, 55

3 a 1, 2, 4 **b** 4

4 a 1, 3, 5, 15 **b** 15

5 a 3 **b** 9 **c** 18

6 a 9 **b** 25 **c** 8 **d** 1

7 a 7 **b** 5 **c** 14

8 a 8 **b** $\frac{4}{5}$

9 a 13 **b** $\frac{4}{7}$

10 5 and 30; 10 and 25; 15 and 20

11 a $8 = 4 \times 2$ and $12 = 4 \times 3$

b 8 is the HCF because $16 = 2 \times 8$.

c 8 and 20; 8 and 28; 12 and 16; 12 and 20; 12 and 28; 16 and 20; 16 and 28; 24 and 28

12 3 or 6 or 12 or 15 or 21 or 24 . . . Any multiple of 3 that is not a multiple of 9.

13 a i 1 **ii** 1 **iii** 1

b The HCF of two consecutive numbers is 1.

c The LCM of two consecutive numbers is the product of the numbers. For example: the LCM of 4 and 5 is 20.

Exercise 1.5

1 $28 \div 4 = 7$; 28 is divisible by 4 and so is 5328; $5 + 3 + 2 + 8 = 18$, which is divisible by 9.

2 **a** odd $= 9 + 7 = 16$; even $= 3 + 2 = 5$; $16 - 5 = 11$

b Yes, the sums are the same. This time odd $= 5$ and even $= 16$; $5 - 16 = -11$.

3 **a** The last two digits make the number 8, which is divisible by 4.

b No, the last three digits are not divisible by 8 because $108 \div 8 = 13$ r. 4.

4 The sum of the digits is $14 + *$. This is a multiple if 3 when it is 15, 18 or 21; $* = 1$ or 4 or 7.

5 1, 7 and 11

6 **a** **i** Any number with these digits that ends in 5.

ii Any number with these digits because the sum of the digits is always 12.

b **i** No, because the sum of the digits is 12.

ii Yes. For example: 1254 is a possible answer. The odd and even digit sums must be $1 + 5$ and $2 + 4$.

7 For example: $322 + 7 + 7 = 336$

8 It is divisible by 1. $520 = 8 \times 65$, so it is divisible by 2, 4, 8. It is also divisible by 3 and therefore also divisible by 6.
$2 + 5 + 2 + 0 = 9$, so it is divisible by 3 and 9.
The last digit is 0, so it is divisible by 5 and 10.
$2520 \div 7 = 360$, so it is divisible by 7.
Odd $= 0 + 5 = 5$ and even $= 2 + 2 = 4$, so it is not divisible by 11. This shows that 11 is the smallest integer that is not a factor.

9 The numbers with an even number of digits. For example: 99, 9999, 999 999, . . .

10 **a** It ends in 5, so it is divisible by 5.
$7 + 9 + 0 + 5 = 21$, so it is divisible by 3.
Hence, it is divisible by 15.

b The final digit must be 0 or 5. If it is 0, the other digit is 2, 5 or 8. If the final digit is 5, then the other digit is 0, 3, 6 or 9. These are the possible numbers: 20 805, 20 820, 20 835, 20 850, 20 865, 20 880, 20 895.

11 1 is a factor. Another factor is 3 because the digit sum is 21, which is a multiple of 3. A third factor is 11 because $9 + 7 = 16$, $2 + 3 = 5$ and $12 - 5 = 11$.

12 It is odd, so it is not divisible by 2, 4, 6, 8 or 10.
It ends in 9, so it is not divisible by 5.
The sum of the digits is 32, so 3 and 9 are not factors. Odd digit sum $= 15$ and even digit sum $= 17$, so 11 is not a factor. The only other possibility is 7, so that must be a factor.

13 **a** 1234 or 3456 or 5678 **b** 3456 or 6789

c 2345

d There are none because odd $-$ even always equals 2.

Exercise 1.6

1 **a** 25 **b** 85 **c** 181

2 **a** 8 **b** 10 **c** 15 **d** 13

3 **a** 9 **b** 152 **c** 56

4 **a** 4 **b** 0 **c** -1

5 **a** 6 **b** 8 **c** 10 **d** 12

6 **a** $\sqrt{400} = 20$ **b** $\sqrt{625} = 25$

c $\sqrt{900} = 30$ **d** $\sqrt{1225} = 35$

7 **a** $\sqrt[3]{216} = 6$ **b** $\sqrt[3]{1000} = 10$

c $\sqrt[3]{1331} = 11$ **d** $\sqrt[3]{3375} = 15$

8 **a** 6 **b** 15 **c** 4

9 **a** $\sqrt{90}$ is between 9 and 10

b $\sqrt{135}$ is between 11 and 12

10 144

11 **a** 121, 144, 169 and 196

b 125

12 7

13 **a** 64 **b** $\sqrt[3]{64} = 4$ and $\sqrt{4} = 2$

14 361

15 2197

16 **a** $\sqrt{64} = 8$ and $\sqrt[3]{64} = 4$

b 729 because $\sqrt{729} = 27$ and $\sqrt[3]{729} = 9$.

c Learner's own answer.