

Answer Key Chapter 1

Student book

Exercise 1B

- 1 a 20 b -20 c -20 d 20 e -10 f 12
g 8 h 8 i -8
2 a 48 b -48 c -10 d 35 e 70 f 70
g -100 h -74 i 1 j 9 k 400 l -400

- 3 a 4 b -4 c 4 d -4 e -2 f -5
g -2 h 2 i -3 j -4
4 a 6 b 48 c -8 d -48 e 20 f -16
g -24 h 108
5 a 36 b 96 c 24 d 64 e -120 f 80
6 a -2 b 4 c -3 d 2 e -6 f -6
g 6 h -1
7 a 1 b -1 c 1 d -1
8 a negative b positive c negative

9 An even number of negative numbers multiplied together will give a positive answer, an odd number a negative answer.

Exercise 1C

- 1 a 12 b 10 c 60 d -56 e -45
2 a -3 b -5 c -10 d 8 e 5
3 By looking at the signs of the two numbers being divided
4 $\frac{15}{-3} = -5$ $\frac{-15}{3} = -5$ $\frac{-15}{-3} = 5$

5

×	Positive	Negative
Positive	Positive	Negative
Negative	Negative	Positive
÷	Positive	Negative
Positive	Positive	Negative
Negative	Negative	Positive

- 6 a -10 b -2 c -2 d -2 e -7 f -3
g 4 h 1 i -1
7 Incorrect:
 $-6 \times -7 = -42$; $(-5)^2 = -25$; $-142 \times -35 = -4970$
Correct:
 $-6 \div -3 = 2$; $-5^2 = -25$; $-6 \times -2 \div -3 = -4$
8 a 36 b -16 c -4
9 a -12 b -6 c -2 d 1
10 a 9 b 3, -3 c No, a number multiplied by itself can never be negative.

Exercise 1D

- 1 a 81 b 11, -11 c 196 d 0
e 169 f 8, -8
2 a 12.96 b 4.1, -4.1 c 0.1024 d 0.4, -0.4
e 129.96 f 0.8, -0.8
3 $(-10)^2 = 100$ and $-10^2 = -100$
4 a 81 b -9 c 0.25 d -2.25
5 a 8 b -27 c 10 d -64
e -1 f -5
6 a 3.375 b -32.768 c -1.7 d -0.1
7 a 1.3 b 2.5, -2.5 c 9.6
8 a 2.8cm b 7.8m c 12.5 mm
9 a 10.24m^2 b 47.61mm^2 c 2.89cm^2
10 1.4m

11 The answer should be negative

12

Question	Estimate without using a calculator	Answer correct to 2 d.p.
$-\sqrt{26.1}$	The answer is between the integers -5 and -6	-5.11
$\sqrt[3]{26}$	The answer is between the integers 2 and 3	2.96
$\sqrt[3]{12.3}$	The answer is between the integers 2 and 3	2.31

- 13 a $\frac{4}{7}$ b $\frac{9}{10}$ c $\frac{5}{8}$
14 a 0.6 b 0.9 c 1.2 d 0.4
e -0.5

15 Write as $\sqrt{\frac{64}{100}}$ (answer is 0.8)

Exercise 1E

- 1 a 3^5 b 7^7 c 5^8 d -2^4
 2 a $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$
 b $2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$
 c $4^4 = 4 \times 4 \times 4 \times 4 = 256$
 d $5^4 = 5 \times 5 \times 5 \times 5 = 625$
 e $1024 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^{10}$
 f $100\,000 = 10 \times 10 \times 10 \times 10 \times 10 = 10^5$
 3 a 104.8576 b 3.71293 c 113.379904
 d 1.61051 e -16807
 4 a 1 b -1 c 1 d -1
 e Odd powers give -1 even powers give 1
 f $(-1)^{20} = 1$ and $(-1)^{37} = -1$
 5 99^{50} on most calculators
 6 9999^{25} on most calculators

Exercise 1F

- 1 b 625 c 128 d 2 e 2
 f 3 g 4 h 4 i 6
 2 a 6 b 8 c 6 d 10
 3 No, he should not have multiplied the bases, the correct answer is 2^7 .
 4 a 6^{10} b 7^{23} c 3^{17} d 10^5
 5 a 2^{13}
 b 72 index form not possible as bases not the same
 c 3600 index form not possible as bases not the same
 d 4^{11}
 6 a 2 h 4 c 6
 7 She has divided the powers instead of subtracting them, the correct answer is 2^8 .
 8 a 2^3 b 3^3 c 4^5 d 7^5 e 9^6 f 5^4
 9 a 2^0 b $3^0 = 1$ c $7^0 = 1$ d $9^0 = 1$
 10 a 1 b 1 c 1 d 1 e 1 f 1
 11 a $6^1 = 6$ b 5^3 c 12^3 d 7^4
 e 20^5 f $q^1 = q$ g $b^1 = b$ h y^{4-m}
 i $4p^4$ j $3x^4$ k $5m^8$

Exercise 1G

- 1 a i 1, 5, 7, 35 ii no
 b i 1, 37 ii yes
 2 a 23, 29, 31, 37, 41, 43, 47
 b 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
 3 a prime b composite
 5 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97
 6 a Once: 2 and 3
 b Never, because at least one of three consecutive numbers must be an even number, and all even numbers greater than 2 are not prime.
 c 1, 3, 5, 7, 9
 7 a 5 and 7 b 8
 8 a 613 is prime b 4999 is prime
 c 30 031 is not prime, 59 is a factor
 9 $2^{82589933} - 1$

Exercise 1H

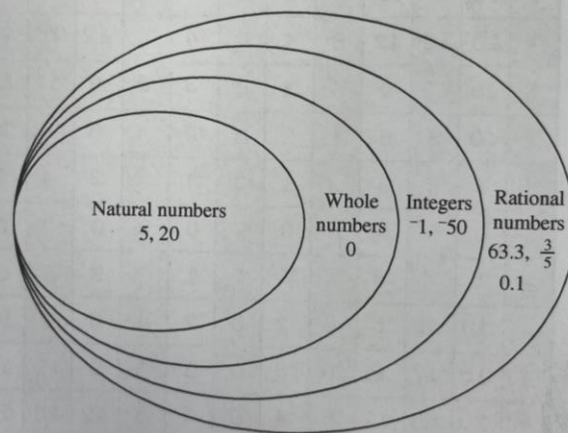
- 1 5, 150
 2 a They do have a HCF. A common factor is always 1 and when there are two different prime numbers this will be the HCF.
 b 10 is a common factor but it is not the highest; the highest is 30.
 c 6 is not even a multiple of both numbers, it is the HCF; the correct answer is 12.
 3 a 36 b 108 c 90 d 10
 4 a 1080 b 1326 c 900 d 7350
 5 a HCF = 2, LCM = 180 b HCF = 1, LCM = 144
 c HCF = 2, LCM = 1800
 6 6cm
 7 7:01 pm
 8 28m
 9 b Neha's method gives LCMs of a 2700, b 1728 and c 1800. Rani was right (as the method only works in part c.)
 c Neha's method works if there are no repeated factors in the left over numbers or if the repeated factors are ignored.
 10 675 and 180

Exercise 1I

- 1 The addition and subtraction should be done left to right, so subtraction before the addition. So the correct answer is 29 ($36 - 10 = 26$, $26 + 3 = 29$)
 2 a 7 b 9 c 4 d -115
 e 16.5
 3 a 25 b 10 c -7
 4 Katy is correct
 5 a 10 b 13
 6 a 2 b 6.24 c 62
 7 a $(\sqrt{9} + 4^2) \times 10 = 190$ b $5 + (14 \div 2) - 3 = 15$
 c $10^2 - \sqrt[3]{1000} + 2 \times (8 - 3) = 80$

Exercise 1J

- 1 Yes Alex is correct
 2 a true b true c true d true
 e true f false g true h false
 3 a true b false c true d false
 4 a 16, 105 b -3, 16, 105 c 105, -3, 0.2, 16, $\frac{5}{16}$, 0.6
 5



- 6 π is not a rational number as it is not exactly equal to $\frac{22}{7}$. It is approximately $\frac{22}{7}$. Its exact value cannot be written as a fraction.

Exercise 1

- 1 a 12 b 24 c 21 d 182
2 a 5 b 4 c 16 d 14

- 3 a -1 b 11 c -30 d 56
4 a -27 b -2 c 1 d 11, -11
5 a 128 b 256 c 125 d 81
6 Jade is wrong. Katy is right.
7 a 3×5 b $2 \times 3 \times 3$ c $2 \times 3 \times 5$
 d $3 \times 3 \times 5$ e $3 \times 3 \times 3$ f $2 \times 2 \times 3 \times 3$
8 a 5 b 6 c 22 d -1
9 a 28, 280 b 15, 150 c 7, 210 d 45, 900
10 a 2^6 b 5^6 c 4^4 d 4^{12}
 e 4^5 f 1
11 26 and 65
12 a $p=8, q=4$ b $r=8, s=4$
13 1 or 0
14 6
15 30 cm

Summary

Check out

- 1 a -120 b -28 c 12 d -55
 e 24 f 20
2 a -3 b 5 c -4 d 4
3 a 9 b -81 c 6, -6 d 7, -7
4 a 5 b -2 c -1 d -3
5 a 64 b 256 c 625 d 81
6 a 2^5 b 5^{11} c 7^{11} d 9^7
 e 4^3 f 1 g 2^4 h 1
7 a $45 = 3 \times 3 \times 5 = 3^2 \times 5$
 b $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$
 c $60 = 2 \times 2 \times 3 \times 5 = 2^2 \times 3 \times 5$
 d $75 = 3 \times 5 \times 5 = 3 \times 5^2$
8 a i 9 ii 360 b i 15 ii 300
9 a 14 b 4 c 9.5 d 60
10 They are all rational numbers.

Answer Key Chapter 1

Homework book

1A-1C

- 1 a -24 b -20 c 42 d -1
e 80 f -56 g 75 h -176
i 40 j 66 k 36 l 42
m 81 n 85 o 96 p 210
- 2 a -4 b -8 c 7 d -1
e 4 f -4 g 17 h -7
i 4 j 2 k 4 l 9
m 15 n 5 o 19 p 6
- 3 a 24 b 30 c 12 d 54
e 56 f -8 g 30 h -1000
- 4 a -4 b 8 c 4 d -5
e -1 f -1 g -27 h 5
- 5 0
- 6 -128
- 7 a 9 b 49 c 100 d 441

1E-1F

- 1 a 8^5 b 4^7 c 7^6 d $(-2)^4$
e $(-5)^4$ f $2^3 \times 3^2$ g $2^2 \times 7^3$ h $3^2 \times 5^4$
- 2 a 81 b 16 c 1 d 10000
e 32 f 243 g 256 h 256
i -32 j 81 k 1 l 625
- 3 a 2.07 b 2293.45 c 148.04 d 92.35
e 2.86 f -9161.33 g 113.38 h -2751.26
- 4 a 10^3 b 3^{11} c Doesn't simplify
d 7^3 e 18^8 f p^6 g $6x^{11}$
h $3m^4$
- 5 a 1 b 1 c 1
- 6 a 400 b 288 c 16 000 d 450

1D

- 1 a 4 b 9 c 49 d 225
e -4 f 9 g 49 h 225
- 2 a 4 and -4 b 9 and -9
c 3 and -3 d 13 and -13
- 3 a 0.2601 b 13.69 c 28.5156
d 723.61 e 2.6 or -2.6 f 0.34 or -0.34
g 52 or -52 h 3.5 or -3.5
- 4 a 10.89 b 4.2
- 5 a 4 b -4 c 216 d -216
e -27 f -1000 g 0 h -8000
- 6 a 3 b 2 c -4 d -10
- 7 a 1.728 b 15.625 c -226.981 d -0.027
e 4.2 f 0.7 g 16 h 2.4
- 8 a 19.683 b 3.1
- 9 a $\frac{3}{7}$ b $\frac{5}{11}$ c $\frac{2}{3}$
d 0.8 e 1.3 f 0.5

1G-1H

- 1 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
- 2 a $2 \times 3 \times 7$ b $2^2 \times 3 \times 5$
c $2^3 \times 3^2 \times 7$ d $2 \times 5^2 \times 11$
- 3 a i 6 ii 420 b i 42 ii 504
c i 10 ii 3300 d i 2 ii 138600
- 4 a 4 b 15
- 5 a 2484 b 3680
- 6 a 4; 240 b 3; 360 c 7; 70
- 7 12:03 and 20 seconds
- 8 4 cm
- 9 5 m
- 10 10 times

11

- 1 a 26 b -5 c 10 d 4
2 a 49 b 7 c 8 d 5.5
3 a -15 b -5 c -180
4 a 15 b 26
5 a 5.7 b 2 c 7.5
6 a $(\sqrt{16} + 5^2) \times 10 = 290$
b $(6 + 15) + 3 - 7 = 0$
c $(8^2 - \sqrt[3]{125}) + (10 \times (9 + 1)) = 0.59$
7 a 2 b $\frac{67}{99}$ c $\frac{14}{17}$
8 a $5 \times 6 + 7$ b $3 \times 4 - 2 - 1$
c $5(8 + 7) + 4$ or $8(4 + 5) + 7$ d $(3 + 5) \times (6 + 7)$

11

- 1 a T b T c T d T
e F f T g F h F
i T
2 a 91; 24 b 91; -9; 24; 0
c All of them d 91; 24; 0
3 a F b T c F d T
4 No: whole numbers include 0