Answer Key Ch. 1 | Lower Secondary
Stage (6-8)

1st Semester | 2023-2024

Subject: Math   **Chapter:** 1
Objectives: To review the answer key of chapter 1 (student book and homework book).

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 2.8 cm   b 7.8 m   c 12.5 mm

9 a 10.24 m²   b 47.61 mm²   c 2.89 cm²

10 1.4 m

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 6 cm

7 7:01 pm

8 28 m

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.
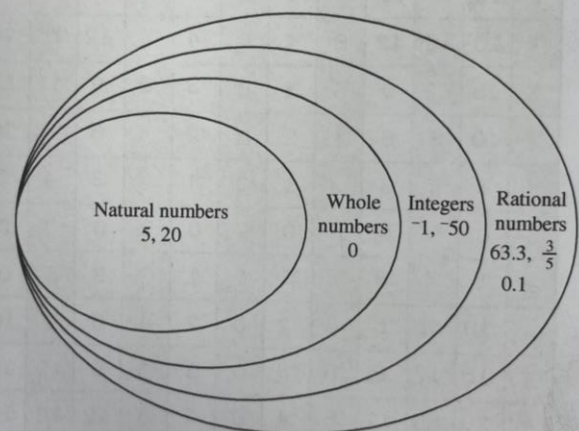
10 675 and 180

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, $\frac{5}{16}$, 0.6̇

5

Natural numbers 5, 20 — Whole numbers 0 — Integers $^-1$, $^-50$ — Rational numbers 63.3, $\frac{3}{5}$, 0.1

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

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.

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

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 $\dfrac{3}{7}$ b $\dfrac{5}{11}$ c $\dfrac{2}{3}$
d 0.8 e 1.3 f 0.5

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 7^6 e 18^8 f p^9 g $6x^{11}$
h $3m^4$

5
a 1 b 1 c 1

6
a 400 b 288 c $16\,000$ d 450

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 $138\,600$

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

1I

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 $\left(\sqrt{16} + 5^2\right) \times 10 = 290$

   b $(6 + 15) \div 3 - 7 = 0$

   c $\left(8^2 - \sqrt[3]{125}\right) \div \left(10 \times (9 + 1)\right) = 0.59$

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 $(3 + 5) \times (6 + 7)$

1J

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