Power and Exponent

Exercise

Solution 1:

(1) 13 × 13 × 13 × 13 × 13 × 13 × 13
Here, 13 is multiplied 7 times,
13 × 13 × 13 × 13 × 13 × 13 × 13
= 137
(2) 27 × 27 × 27 × 27 × 27 × 27 × 27 × 27
Here, 27 is multiplied 8 times,
27 × 27 × 27 × 27 × 27 × 27 × 27 × 27
= 278
(3) 11 × 11 × 6 × 6 × 6 × 11 × 7 × 7 × 7
= 11 × 11 × 11 × 6 × 6 × 6 × 7 × 7 × 7
= 113 × 63 × 73

Solution 2:

(1) 44 = 4 × 4 × 4 × 4 = 256
(2) 63 × 16 = 6 × 6 × 6 × 1 × 1 × 1 × 1 × 1 × 1 = 216
(3) 23 × 82 = 2 × 2 × 2 × 8 × 8 = 8 × 64 = 512
(4) 25 × 32 × 5 = 2 × 2 × 2 × 2 × 2 × 3 × 3 × 5 = 32 × 9 × 5 = 1440
(5) 24 × 52 = 2 × 2 × 2 × 2 × 5 × 5 = 16 × 25 = 400
(6) 72 × 52 = 7 × 7 × 5 × 5 = 49 × 25 = 1225
(7) 82 × 92 = 8 × 8 × 9 × 9 = 64 × 81 = 5184
(8) 53 × 24 = 5 × 5 × 5 × 2 × 2 × 2 × 2 = 125 × 16 = 2000
(9) 33 × 53 = 3 × 3 × 3 × 5 × 5 × 5 = 27 × 125 = 3375
(10) 63 × 32 = 6 × 6 × 6 × 3 × 3 = 216 × 9 = 1944
(11) 33 × 24 × 52 = 3 × 3 × 3 × 2 × 2 × 2 × 2 × 5 × 5
= 27 × 16 × 25 = 10800
(12) 32 × 62 × 52 = 3 × 3 × 6 × 6 × 5 × 5 = 9 × 36 × 25 = 8100

Practice – 1

Solution 1:

(1) 2 × 2 × 5 × 5 × 12 × 12
= 2 × 2 × 5 × 5 × 12 × 12
= 22 × 52 × 122
(2) 5 × 5 × 5 × 14 × 14× 14 × 3 × 3 × 3
= 5 × 5 × 5 × 14 × 14× 14 × 3 × 3 × 3
= 53× 143× 33
(3) 4 × 4 × 6 × 6 × 6 × 7 × 7 × 7 × 7
= 4 × 4 × 6 × 6 × 6 × 7 × 7 × 7 × 7
= 42 × 63× 74
(4) 3 × 3 × 5 × 3 × 5 × 3
= 3 × 3 × 3 × 3 × 5 × 5
= 34 × 52

Solution 2:

(1) 8 × 8 × 8 × 8 × 8 × 8 is written as 86 in the form of power.
[Here, the number 8 is multiplied 6 times. Hence, it can be written in the form of power as 86.]
(2) In 59, base is 5 and exponent is 9.
(3) Ten raised to four is written as 104 in the form of power.

Practice – 2

Solution 1:

(1) 34 = 3 × 3 × 3 × 3 = 81
(2) 103 = 10 × 10 × 10 = 1000
(3) 11 × 92 = 11 × 9 × 9 = 99 × 9 = 891
(4) 15 × 43 × 5 = 1 × 1 × 1 × 1 × 1 × 4 × 4 × 4 × 5 = 1 × 64 × 5 = 320
(5) 63 = 6 × 6 × 6 = 36 × 6 = 216
(6) 72 × 34 = 7 × 7 × 3 × 3 × 3 × 3 = 49 × 81 = 3969
(7) 24 × 32 = 2 × 2 × 2 × 2 × 3 × 3 = 144
(8) 83 × 62 = 8 × 8 × 8 × 6 × 6 = 18,432
(9) 23 × 43 = 2 × 2 × 2 × 4 × 4 × 4 = 8 × 64 = 512
(10) 25 × 4 = 2 × 2 × 2 × 2 × 2 × 4 = 32 × 4 = 128

Solution 2:

(1) 24 × 32 = 2 × 2 × 2 × 2 × 3 × 3 = 16 × 9 = 144
(2) 32 × 72 = 3 × 3 × 7 × 7 = 9 × 49 = 441
(3) 22 × 32 × 42 = 2 × 2 × 3 × 3 × 4 × 4 = 4 × 9 × 16 = 576
(4) 17 × 52 × 6 = 1 × 5 × 5 × 6 = 1 × 25 × 6 = 150
(5) 22 × 34 × 42 = 2 × 2 × 3 × 3 × 3 × 3 × 4 × 4 = 4 × 81 × 16 = 5,184
(6) 32 × 53 × 62 = 3 × 3 × 5 × 5 × 5 × 6 × 6 = 9 × 125 × 36 = 40,500