Chapter 3: Squares and Square Roots
Page No: 42
Exercise 3A

Question 1:
Solution:

(i) 441 – the prime factors are (3, 3, 7, 7). So this is a perfect square.
(ii) 576 – the prime factors are (2, 2, 2, 2, 2, 2, 3, 3). So this is a perfect square.
(iii) 11025 – the prime factors are (3, 3, 5, 5, 7, 7). So this is a perfect square.
(iv) 1176 – the prime factors are (2, 2, 2, 3, 7, 7). So this is not a perfect square.
(v) 5625 – The prime factors are (3, 3, 5, 5, 5, 5). So this is a perfect square.
(vi) 9075 – The prime factors are (3, 5, 5, 11, 11). So this is not a perfect square.
(vii) 4225 – The prime factors are (5, 5, 13, 13). So this is a perfect square.
(viii) 1089 – The prime factors are (3, 3, 11, 11). So this is a perfect square.

Question 2:
Solution:

(i) 1225 – This is the product of (5, 5, 7, 7). So the number whose square is the given number is the product of (5, 7) = 35.
(ii) 2601 – This is the product of (3, 3, 17, 17). So the number whose square is the given number is the product of (3, 17) = 51.
(iii) 5929 – This is the product of (7, 7, 11, 11). So the number whose square is the given number is the product of (11, 7) = 77.
(iv) 7056 – This is the product of (2, 2, 2, 2, 3, 3, 7, 7). So the number whose square is the given number is the product of (2, 2, 3, 7) = 84.
(v) 8281 – This is the product of (7, 7, 13, 13). So the number whose square is the given number is the product of (7, 13) = 91.

Question 3:
Solution:

(i) 3675 = product of (3, 5, 5, 7, 7). So the number should be multiplied by 3. The number whose square is the new number is the product of (3, 5, 7) = 105.
(ii) 2156 = product of (2, 2, 7, 7, 11). So the number should be multiplied by 11. The number whose square is the new number is the product of (2, 7, 11) = 154.
(iii) 3332 = product of (2, 2, 7, 7, 17). So the number should be multiplied by 17. The number whose square is the new number is the product of (2, 7, 17) = 238.
(iv) 2925 = product of (3, 3, 5, 5, 13). So the number should be multiplied by 13. The number whose square is the new number is the product of (3, 5, 13) = 195.
(v) 9075 = product of (3, 5, 5, 11, 11). So the number should be multiplied by 3. The number whose square is the new number is the product of (3, 5, 11) = 165.

(vi) 7623 = product of (3, 3, 7, 11, 11). So the number should be multiplied by 7. The number whose square is the new number is the product of (3, 7, 11) = 231.

(vii) 3380 = product of (2, 2, 5, 13, 13). So the number should be multiplied by 5. The number whose square is the new number is the product of (2, 5, 13) = 130.

(viii) 2475 = product of (3, 3, 5, 5, 11). So the number should be multiplied by 11. The number whose square is the new number is the product of (3, 5, 11) = 165.

Question 4:

Solution:

(i) 1575 = product of (3, 3, 5, 5, 7). So the number should be divided by 7. The number whose square is the new number is the product of (3, 5) = 15.

(ii) 9075 = product of (3, 5, 5, 11, 11). So the number should be divided by 3. The number whose square is the new number is the product of (5, 11) = 55.

(iii) 4851 = product of (3, 3, 7, 7, 11). So the number should be divided by 11. The number whose square is the new number is the product of (3, 7) = 21.

(iv) 3380 = product of (2, 2, 5, 13, 13). So the number should be divided by 5. The number whose square is the new number is the product of (2, 13) = 26.

(v) 4500 = product of (2, 2, 3, 3, 5, 5, 5). So the number should be divided by 5. The number whose square is the new number is the product of (2, 3, 5) = 30.

(vi) 7776 = product of (2, 2, 2, 2, 2, 3, 3, 3, 3, 3). So the number should be divided by 6. The number whose square is the new number is the product of (2, 2, 3, 3) = 36.

(vii) 8820 = product of (2, 2, 3, 3, 5, 7, 7). So the number should be divided by 5. The number whose square is the new number is the product of (2, 3, 7) = 42.

(viii) 4056= product of (2, 2, 2, 3, 13, 13). So the number should be divided by 6. The number whose square is the new number is the product of (2, 13) = 26.

Question 5:

Solution:

The largest 2 digit number is 99.

```
      9
   _______
9 | 99
    81
   |_____
    18
```

So 18 is subtracted from 99 to obtain the square of 9 which is equal to 81.

Question 6:

Solution:

The largest 3 digit number is 999.

```
      31
   _________
 3 | 999
       9
     |_____
61|   099
       61
     |_____
       38
```

So 38 is subtracted from 999 to obtain the square of 31 which is equal to 961.

Page No: 45
Exercise 3B

Question 1:
Solution:
All the numbers given above either end with a 2, 3, 7, 8 or have an odd number of zeroes in the end. So they are all not perfect squares.

Question 2:
Solution:

(i) 196 – is an even number so it is the square of an even number.
(ii) 441 – is an odd number so it is the square of an odd number.
(iii) 900 – is an even number so it is the square of an even number.
(iv) 625 – is an odd number so it is the square of an odd number.
(v) 324– is an even number so it is the square of an even number.

Question 3:
Solution:

(i) 484 – is an even number so it is the square of an even number.
(ii) 961 – is an odd number so it is the square of an odd number.
(iii) 7396 – is an even number so it is the square of an even number.
(iv) 8649 – is an odd number so it is the square of an odd number.
(v) 4225 – is an odd number so it is the square of an odd number.

Question 4:
Solution:

(i) (1+3+5+7+9+11+13) = sum of first 7 odd numbers = square of 7 = 49.
(ii) (1+3+5 +7 +9+11+13+15+17+19) = sum of first 10 odd numbers = square of 10 = 100.

(iii) (1 +3 +5+7+9+11+13+15+17+19+21+23) = sum of first 12 odd numbers = square of 12 = 144.

Question 5:

Solution:

We know that n^2 is the sum of the first n odd natural numbers.

(i) So, $9^2 = 81$ = sum of first 9 odd numbers = (1+3+5+7+9+11+13+15+17)

(i) So, $10^2 = 100$ = sum of first 10 odd numbers = (1+3+5+7+9+11+13+15+17+19)

Question 6:

Solution:

(i) 6

For every natural number m>1, (2m, m^2-1, m^2+1) is a Pythagorean triplet.

Since 2m = 6, we get m = 3

Thus the triplet is (6, 8, 10)

(ii) 14

For every natural number m>1, (2m, m2-1, m2+1) is a Pythagorean triplet.

Since 2m = 14, we get m = 7

Thus the triplet is (14, 48, 50)

(iii) 16

For every natural number m>1, (2m, m2-1, m2+1) is a Pythagorean triplet.

Since 2m = 16, we get m = 8

Thus the triplet is (16, 63, 65)

(iv) 20

For every natural number m>1, (2m, m2-1, m2+1) is a Pythagorean triplet.

Since 2m = 20, we get m = 10

Thus the triplet is (20, 99, 101)

Question 7: Evaluate:

Solution:

(i) $(38)^2 - (37)^2 = (38+37) = 75$

(ii) $(75)^2 - (74)^2 = (75+74) = 149$

(iii) $(92)^2 - (91)^2 = (92+91) = 183$

(iv) $(105)^2 - (104)^2 = (105+104) = 209$

(v) $(141)^2 - (140)^2 = (141+140) = 281$

(vi) $(218)^2 - (217)^2 = (218+217) = 435$

Question 8:

Solution:

(i) $(310)^2 = (300+10)^2 = (300)^2 + (2\times300\times10) + (10)^2 = 90000 + 6000 + 100 = 96100$

(ii) $(508)^2 = (500+8)^2 = (500)^2 + (2\times500\times8) + (8)^2 = 250000 + 8000 + 64 = 258064$

(iii) $(630)^2 = (600+30)^2 = (600)^2 + (2\times600\times30) + (30)^2 = 360000 + 36000 + 900 = 396900$

Question 9:

Solution:

(i) $(196)^2 = (200-4)^2 = (200)^2 - (2\times200\times4) + (4)^2 = 40000 + 16 - 1600 = 38416$

(ii) $(689)^2 = (700-11)^2 = (700)^2 - (2\times700\times11) + (11)^2 = 490000 + 121 - 15400 = 474721$

(iii) $(891)^2 = (900-9)^2 = (900)^2 - (2\times900\times9) + (9)^2 = 810000 - 16200 + 81 = 793881$

Question 10:

Solution:

(i) $69 \times 71 = (70-1)\times(70+1) = 70^2 - 1^2 = 4900 - 1 = 4899$

(ii) $94 \times 106 = (100-6)\times(100+6) = 100^2 - 6^2 = 10000 - 36 = 9964$

Question 11:

Solution:

(i) $88 \times 92 = (90-2)\times(90+2) = 90^2 - 2^2 = 8100 - 4 = 8096$

(ii) $78 \times 82 = (80-2)\times(80+2) = 80^2 - 2^2 = 6400 - 4 = 6396$

Question 12:

Solution:

(i) The square of an even number is **even**.

(ii) The square of an odd number is **odd**.

(iii) The square of a proper fraction is **less** than the given fraction.

(iv) n^2 = the sum of first n **odd** natural numbers.

Question 13:

Solution:

(i) (F) as the number of digits in a perfect square is not even always.

(ii) (F) as the square of a prime number will not be prime.

(iii) (F) as the sum of two perfect squares will not be a perfect square.

(iv) (F) as the difference of two perfect squares will not be a perfect square.

(v) (T) as the product of two perfect squares is another perfect square.

Page No: 48

Exercise 3C

Find the value of each of the following, using the column method:

Question 1:

Solution:

I	II	III
a^2	2ab	b^2
4+1=5	12	9

Answer is 529.

Question 2:

Solution:

I	II	III
a^2	2ab	b^2
9+3=12	30+2=32	25

Answer is 1225.

Question 3:

Solution:

I	II	III
a^2	2ab	b^2
25+2	20	4

Answer is 2704.

Question 4:

Solution:

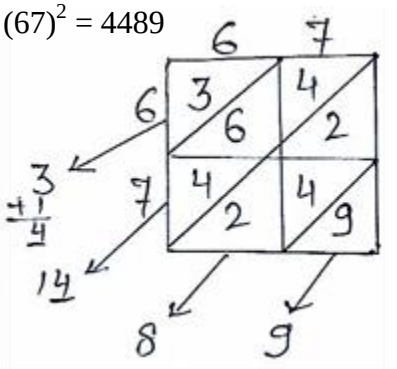
I	II	III
a^2	2ab	b^2
81+11=92	108+3=111	36

Answer is 9216.

Question 5:

Solution:

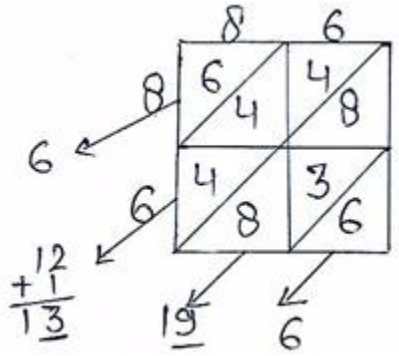
$(67)^2 = 4489$



Question 6:

Solution:

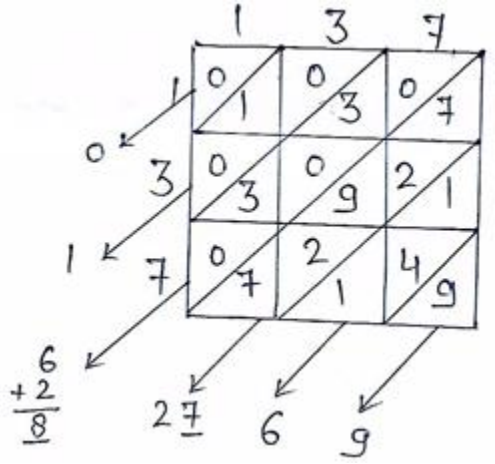
$(86)^2 = 7396$



Question 7:

Solution:

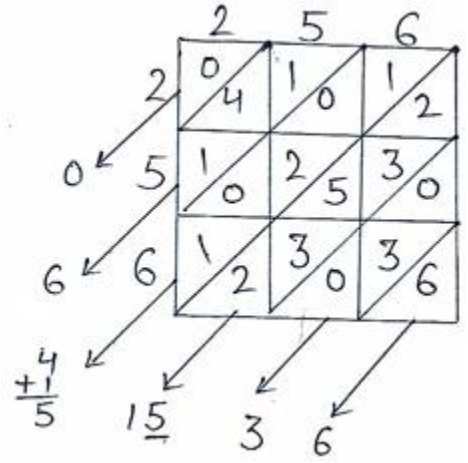
$(137)^2 = 18769$



Question 8:

Solution:

$(256)^2 = 65536$



Page No: 50

Exercise 3D

Question 1:

Solution:

5 |225
---
5 | 45
---
3 | 9

3

Thus 225 is the product of 3, 3, 5, 5

The square root is thus the product of 3, 5 = 15.

Question 2:

Solution:

3 |441
---
3 | 147
---
7 | 49

7

Thus 441 is the product of 3, 3, 7, 7

The square root is thus the product of 3, 7 = 21.

Question 3:

Solution:

3 |729
---
3 | 243
---
3 | 81
---
3 | 27
---
3 | 9

3

Thus 729 is the product of 3, 3, 3, 3, 3, 3

The square root is thus the product of 3, 3, 3 = 27.

Question 4:

Solution:

2 |1296
---
2 | 648
---
2 | 324
---
2 | 162
---
3 | 81
---
3 | 27
---
3 | 9

3

Thus 1296 is the product of 2, 2, 2, 2, 3, 3, 3, 3

The square root is thus the product of 2, 2, 3, 3 = 36.

Question 5:

Solution:

5 |2025
---
5 | 405
---
3 | 81
---
3 | 27

---
3 | 9

3

Thus 2025 is the product of 3, 3, 3, 3, 5, 5.
The square root is thus the product of 3, 3, 5 = 45.

Question 6:
Solution:
2 |4096
---
2 | 2048
---
2 | 1024
---
2 | 512
---
2 | 256
---
2 | 128
---
2 | 64
---
2 | 32
---
2 | 16
---
2 | 8
---
2 | 4

2

Thus 4096 is the product of 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2
The square root is thus the product of 2, 2, 2, 2, 2, 2 = 64.

Question 7:
Solution:
2 |7056
---
2 | 3528
---
2 | 1764
---
2 | 882
---

3 | 441
---
3 | 147
---
7 | 49

7

Thus 7056 is the product of 2, 2, 2, 2, 3, 3, 7, 7.
The square root is thus the product of 2, 2, 3, 7 = 84.

Question 8:
Solution:

2 |8100
---
2 | 4050
---
5 | 2025
---
5 | 405
---
3 | 81
---
3 | 27
---
3 | 9

3

Thus 8100 is the product of 2, 2, 5, 5, 3, 3, 3, 3.
The square root is thus the product of 2, 3, 3, 5 = 90.

Question 9:
Solution:

2 |9216
---
2 | 4608
---
2 | 2304
---
2 | 1152
---
2 | 576
---
2 | 288
---
2 | 144

---
2 | 72
---
2 | 36
---
2 | 18
---
3 | 9

3

Thus 9216 is the product of 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3.
The square root is thus the product of 2, 2, 2, 2, 2, 3 = 96.

Question 10:
Solution:
5 |11025
---
5 | 2205
---
3 | 441
---
3 | 147
---
7 | 49

7

Thus 11025 is the product of 5, 5, 3, 3, 7, 7.
The square root is thus the product of 5, 3, 7 = 105.

Question 11:
Solution:
2 |15876
---
2 | 7938
---
3 | 3969
---
3 | 1323
---
3 | 441
---
3 | 147
---
7 | 49

7

Thus 15876 is the product of 2, 2, 3, 3, 3, 3, 7, 7.
The square root is thus the product of 2, 3, 3, 7 = 126.

Question 12:
Solution:
2 |17424
---
2 | 8712
---
2 | 4356
---
2 | 2178
---
3 | 1089
---
3 | 363
---
11 | 121

11
Thus 17424 is the product of 2, 2, 2, 2, 3, 3, 11, 11.
The square root is thus the product of 2, 2, 3, 11 = 132.

Question 13:
Solution:
252 = product of 2, 2, 3, 3, 7.
So 252 must be multiplied by 7 to obtain a perfect square of 1764.
The square root of 1764 is then determined.
4) 1764 (42
16
_____
82) 164
164
_____
0
Thus the perfect square of 1764 is obtained by multiplying the given number by 7. The square root is 42.

Question 14:
Solution:
The value $2925 = 3 \times 3 \times 5 \times 5 \times 13$
So this number must be divided by 13 => $2925 \div 13 = 225$

Now the square root of 225 is obtained.

1) 225 (15
1

_____

25) 125
125

_____

0

The square root is thus 15 and the number that must be divided is 13.

Question 15:

Solution:

Given the number of plants = 1225 plants.

So the no. of rows = number of plants in each row = square root of 1225

3) 1225 (35
9

_____

65) 325
325

_____

0

So the no. of rows = number of plants in each row = 35.

Question 16:

Solution:

Given that each student contributed the same amount as the number of children in the class. So,

$x^2 = 1156 \Rightarrow x = 34$

3) 1156 (34
9

_____

64) 256
256

_____

0

So the strength of the class is 34.

Question 17:

Solution:

The LCM of numbers 6, 9, 15 and 20 is 180.

2 |180
---

2 | 90
---

3 | 45

---
3 | 15

5

So 120 = product of 2, 2, 3, 3, 5. So to make it a perfect square we need to multiply it by 5
So we get product of 180 and 5 to be 900.

Question 18:

Solution:

The LCM of numbers 8, 12, 15 and 20 is 120.

2 |120
---
2 | 60
---
2 | 30
---
3 | 15

5

So 120 = product of 2, 2, 2, 3, 5. So to make it a perfect square we need to multiply it by 2, 3 and 5 = 30
So we get product of 120 and 30 to be 3600.

Page No: 54

Exercise 3E

Evaluate:

Question 1:

Solution:

2) 576 (24
4
_____
44) 176
176
_____
0

Therefore, square root of 576 = 24

Question 2:

Solution:

3) 1444 (38
9
_____

68) 544
544
_____
0
Therefore, square root of 1444 = 38

Question 3:

Solution:

6) 4489 (67
36
_____
127) 0889
0889
_____
0
Therefore, square root of 4489 = 67

Question 4:

Solution:

7) 6241 (79
49
_____
149)1341
1341
_____
0
Therefore, square root of 6241 = 79

Question 5:

Solution:

8) 7056 (84
64
_____
164) 656
656
_____
0
Therefore, square root of 7056 = 84

Question 6:

Solution:

9) 9025 (95
81
_____

185)925
925
_____
0
Therefore, square root of 9025 = 95

Question 7:
Solution:
1) 11449 (107
1
_____
20) 14
00
_____
207)1449
1449
_____
0
Therefore, square root of 11449 = 107

Question 8:
Solution:
1) 14161 (119
1
_____
21) 041
021
_____
229)02061
02061
_____
0
Therefore, square root of 14161 = 119

Question 9:
Solution:
1) 10404 (102
1
_____
20) 04
00
_____
102)0404
0404
_____
0

Therefore, square root of 10404 = 102

Question 10:

Solution:

```
1 ) 17956 ( 134
     1
_________
23) 79
     69
__________
264)1056
     1056
___________
          0
```

Therefore, square root of 17956 = 134

Question 11:

Solution:

```
1 ) 19600 ( 140
     1
_________
24)  96
      96
__________
       0
```

Therefore, square root of 19600 = 140

Question 12:

Solution:

```
3 ) 92416 ( 304
     9
_________
60) 24
     00
__________
604)2416
     2416
___________
          0
```

Therefore, square root of 92416 = 304

Question 13:

Solution:

We find the square root of 2509 using the long division method.

```
      50
   _________
 5 | 2509
 5 | 25
   |_____
100|    09
```

Here, the remainder is 9.
Hence, $50^2 < 2509$
And we know that, $50^2 = 2500$
Hence, the number to be subtracted is 2509 - 2500 = 9

Question 14:
Solution:
On finding the square root of 7581

```
      87
   _________
 8 | 7581
     64
   |_____
167| 1181
     1169
   |_____
       12
```

Quotient = 87, remainder = 12
Hence we will subtract 12 from 7581 which is 7569 to get the perfect square.
Hence the square root of 7569 is 87

Question 15:
Solution:

```
      78
   _________
 7 | 6203
     49
   |_____
148| 1303
     1184
   |_____
       119
```

Since this number is close to the square of 78, the square of 79 is 6241 which is obtained by adding 38 to the given number.
The perfect square of 6241 is obtained by adding 38. Its square root is 79.

Question 16:

Solution:

```
        91
    _________
  9 | 8400
      81
    |_____
181|  300
       181
    |_____
         119
```

So to obtain the square of 92 which is 8464, we need to add 64 to the given number.

Question 17:

Solution:

The smallest 4 digit number is 1000.

```
        31
    _________
  3 | 1000
      09
    |_____
 61|  0100
        61
    |_____
         39
```

So the least 4 digit number which is a perfect square is 32 and its square is 1024.

Question 18:

Solution:

The greatest five digit number is 99999.

```
        316
    _________
  3 | 99,999
      9
    |_____
 61|  099
       61
    |_____
  62|  3899
       3756
    |_____
        143
```

So 143 is subtracted from 99,999 to obtain the square of 316 which is equal to 99856.

Question 19:

Solution:

Area of the field = 60025 = side²

So the side = $\sqrt{60025}$ = 245 m

So the perimeter = 4 times the side = $245 \times 4\ m$

Since the speed= 18 km/h, $18\ km/h = 18 \times \frac{5}{18}\ m/s = 5\ m/s.$

Hence the time taken = $\frac{245 \times 4}{5} = 49 \times 4 = 196 \text{sec}$

Hence the required time is 196 seconds.

Page No: 56

Exercise 3F

Evaluate:

Question 1:

Solution:

```
        1.3
    ___________
  1 | 1.69
      1
    |_____
 23|  0.69
      0.69
    |_____
        0
```

So $\sqrt{\mathbf{1.69}}$ = 1.3

Question 2:

Solution:

```
        5.8
    ___________
  5 | 33.64
      25
    |_____
108|  08.64
       08.64
    |_____
        0
```

So $\sqrt{\mathbf{33.64}}$ = 5.8

Question 3:

Solution:

```
        12.5
    _________
  1 | 156.25
      1
    |_____
 22|  056
      044
    |_____
245|  12.25
       12.25
    |_____
           0
```

So $\sqrt{\mathbf{156.25}} = 12.5$

Question 4:

Solution:

```
        8.7
    _________
  8 | 75.69
      64
    |_____
167|  11.69
       11.69
    |_____
           0
```

So, $\sqrt{\mathbf{75.69}} = 8.7$

Question 5:

Solution:

```
        3.14
    _________
  3 | 9.8596
      9
    |_____
 61|  0.85
      0.61
    |_____
624|  0.2496
       0.2496
    |_____
           0
```

So $\sqrt{\mathbf{9.8596}} = 3.14$

Question 6:

Solution:

```
        3.17
     _________
  3 | 10.0489
        9
     |_____
 61|   1.04
        0.61
     |_____
627|   0.4389
         0.4389
     |_____
           0
```

So $\sqrt{\mathbf{10.0489}} = 3.17$

Question 7:

Solution:

```
        1.04
     _________
  1 | 1.0816
        1
     |_____
204|   0.0816
         0.0816
     |_____
           0
```

So, $\sqrt{\mathbf{1.0816}} = 1.04$

Question 8:

Solution:

```
        0.54
     _________
  0 | 0.2916
        0
     |_____
 05|   0.29
        0.25
     |_____
104|   0.0416
         0.0416
     |_____
           0
```

So, $\sqrt{\mathbf{0.2916}} = 0.54$

Question 9:

Solution:

```
        1.73
     _________
1    | 3.0000
         1
       |_____
 27|   2.00
         1.89
       |_____
 343|   0.1100
          0.1029
       |_____
          0.071
```

$\sqrt{3}$ up to two places of decimal = 1.73

Question 10:

Solution:

```
        1.67
     _________
   1 |  2.8000
         1
       |_____
 26|   1.80
         1.56
       |_____
 327|   0.2400
          0.2289
        |_____
          0.0111
```

So $\sqrt{2.8}$ correct up to two places of decimal = 1.67

Question 11:

Solution:

```
        0.948
     _________
   0 |  0.900000
         0
       |_____
 09|   0.90
         0.81
       |_____
 184|   0.0900
          0.0736
       |_____
```

1888| 0.016400
0.015104
|_____
0.001296

So, $\sqrt{\mathbf{0.9}}$ correct up to two places of decimal. = 0.95 obtained by rounding off 0.948.

Question 12:

Solution:

Area of rectangle = product of length and breadth = $13.6 \times 3.4 = 46.24$

Here the area of a square = area of rectangle

So the area of square = 46.24

Therefore, side² = 46.24

Side of square = $\sqrt{46.20}$ = 6.8m

Page No: 58

Exercise 3G

Question 1:

Solution:

$$\sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$$

Question 2:

Solution:

$$\sqrt{\frac{64}{225}} = \frac{\sqrt{64}}{\sqrt{225}} = \frac{8}{15}$$

Question 3:

Solution:

$$\sqrt{\frac{121}{256}} = \frac{\sqrt{121}}{\sqrt{256}} = \frac{11}{16}$$

Question 4:

Solution:

$$\sqrt{\frac{625}{729}} = \frac{\sqrt{625}}{\sqrt{729}} = \frac{25}{27}$$

Question 5:

Solution:

$$\sqrt{3\frac{13}{36}} = \sqrt{\frac{121}{36}} = \frac{11}{6} = 1\frac{5}{6}$$

Question 6:

Solution:

$$\sqrt{4\frac{73}{324}} = \sqrt{\frac{1396}{324}} = \frac{37}{18} = 2\frac{1}{18}$$

Question 7:

Solution:

$$\sqrt{3\frac{33}{289}} = \sqrt{\frac{900}{289}} = \frac{30}{17} = 1\frac{13}{17}$$

Question 8:

Solution:

$$\frac{\sqrt{80}}{\sqrt{405}} = \sqrt{\frac{80}{405}} = \sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$$

Question 9:

Solution:

$$\frac{\sqrt{1183}}{\sqrt{2023}} = \sqrt{\frac{169}{289}} = \frac{\sqrt{169}}{\sqrt{289}} = \frac{13}{17}$$

Question 10:

Solution:

$$\sqrt{98} \times \sqrt{162} = \sqrt{98} \times \sqrt{162} = \sqrt{15876}$$

```
      126
   ____________
 1 | 15876
       1
     |_______
 22|   058
         44
     |_______
 246|   1476
         1476
     |_______
         0
```

So $\sqrt{98} \times \sqrt{162} = 126$.

Page No: 58
Exercise 3H
OBJECTIVE QUESTIONS
Tick (√) the correct answer in each of the following:

Question 1:
Solution:
(c) Since 5478 ends in 8, it cannot be a perfect square.

Question 2:
Solution:
(d) 2222 ends in 2 and hence cannot be a perfect square.

Question 3:
Solution:
(a) 1843 ends in 3 and hence is not a perfect square.

Question 4:
Solution:
(b) As 4784 ends in 7, it cannot be a perfect square.

Question 5:
Solution:
(c) 81000 as the number of zeros at the end is odd.

Question 6:
Solution:
(d) 8 cannot be the last (unit) digit of a perfect square number.

Question 7:
Solution:
(b) as the square of a proper fraction will usually be smaller than the fraction.

Question 8:
Solution:
(c) n^2 as the sum of the n odd terms is the square of n itself.

Question 9:
Solution:
(d) For every natural number m>1, $(2m, m^2-1, m^2+1)$ is a Pythagorean triplet.

So, (8, 15, 17) is correct.

Question 10:
Solution: (c)

```
        13
     _______
  1 | 176
        1
     |_____
 23|  076
        69
     |_____
         7
```

So 7 must be subtracted.

Question 11:
Solution: (a)

```
        22
     _______
  2 | 526
        4
     |_____
 42|  126
        84
     |_____
         42
```

So the number to be added is 3 as the square root of 529 is 23.

Question 12:
Solution:
(b)

```
        123
     _______
  1 | 15370
        1
     |_____
 22|  053
        44
     |_____
243|   970
       729
     |_____
        241
```

So in order to obtain the square of 124, we need to add 6.

Question 13:
Solution:
(d) 0.94 is the square root of 0.9 found using the usual method.

Question 14:
Solution:
(c) 0.316 is the square root of 0.1 found using the general method.

Question 15:
Solution:
(b) $\sqrt{0.9} \times \sqrt{1.6} = \sqrt{1.44} = 1.2$

Question 16:
Solution:
(c) $\frac{\sqrt{288}}{\sqrt{128}} = \sqrt{\frac{288}{128}} = \sqrt{\frac{9}{4}} = \frac{3}{2}$

Question 17:
Solution:
(b) $\sqrt{2\frac{1}{4}} = \sqrt{\frac{9}{4}} = \frac{3}{2} = 1\frac{1}{2}$

Question 18:
Solution:
(a) Since the square of an even number is even, the answer is 196.

Question 19:
Solution:
(c) Since the square of an odd number is odd, 1369 is the answer.

Page No: 62
TEST PAPER – 3
A.
Question 1:
Solution:

```
      106
   ________
1 | 11236
      1
```

```
    |_____
20| 012
      00
    |_____
206|  1236
       1236
    |_____
          0
```

So $\sqrt{\mathbf{11236}}$ = 106.

Question 2:

Solution:

The largest 5 digit number is 99, 999.

```
       316
   _________
 3 | 99,999
     9
    |_____
61| 099
      61
    |_____
 62|  3899
       3756
    |_____
      143
```

So 143 is subtracted from 99,999 to obtain the square of 316 which is equal to 99856.

Question 3:

Solution:

The smallest 4 digit number is 1000.

```
       31
   _________
 3 | 1000
     09
    |_____
61| 0100
      61
    |_____
      39
```

So the least 4 digit number which is a perfect square is 32 and its square is 1024.

Question 4:
Solution:

```
        0.53
      _______
   5 | 0.2809
       0.25
      |_____
 103|  0.0309
        0.0309
      |_____
           0
```

So $\sqrt{\mathbf{0.2809}}$ = 0.53

Question 5:
Solution:

```
 1.73
      _______
1   | 3.0000
        1
      |_____
 27|  2.00
        1.89
      |_____
 343|  0.1100
        0.1029
      |_____
        0.071
```

$\sqrt{\mathbf{3}}$ up to two places of decimal = 1.73

Question 6:
Solution:

$$\frac{\sqrt{48}}{\sqrt{243}} = \sqrt{\frac{48}{243}} = \sqrt{\frac{16}{81}} = \frac{4}{9}$$

B.
Question 7:
Solution:
(d) As 1222 ends in 2, it is not a perfect square.

Question 8:
Solution:
(c) $\sqrt{2\frac{1}{4}} = \sqrt{\frac{9}{4}} = \frac{\sqrt{9}}{\sqrt{4}} = \frac{3}{2} = 1\frac{1}{2}$

Question 9:

Solution:

(c) As the square of an even number is even too.

Question 10:

Solution:

(d)

```
      22
   _________
2  | 521
       4
     |_____
42|   121
       84
     |_____
        37
```

So, 8 must be added to obtain the square of 23.

Question 11:

Solution:

(c)

```
          13
   _________
1  |  178
       1
     |_____
23|   78
       69
     |_____
        9
```

Question 12:

Solution:

(b) $\sqrt{\mathbf{72}}\ \mathbf{x}\ \sqrt{\mathbf{98}} = \sqrt{7056} = 84$

C.

Question 13:

Solution:

(i) $1 + 3 + 5 + 7 + 9 + 11 + 13 = (7)^2$ as the sum of n odd terms is n^2

(ii) $\sqrt{\mathbf{1681}} = 41$ using the general method of finding square roots.

```
      41
   _________
4  |  1681
```

```
      16
    |_____
81| 0081
      0081
    |_____
       0
```

(iii) The smallest square number exactly divisible by 2, 4, 6 is 36. (The LCM of 2, 4, 6 = 12. By factorization, 12 is the product of (2, 2, 3). So the smallest square number is the product of (2, 2, 3, 3) = 36.)

(iv) A given number is a perfect square having n digits, where n is odd. Then, its square root will have $\frac{1}{2}(n+1)$ digits. (Take the example of 256, there are 3 digits in it. Its square root has 2 digits that satisfies the given result. Similarly for the case of 15376.)