Chapter – 06

Squares and Square Roots

Exercises 6.2

Question 1.

Find the square of the following numbers

(i) 32 (ii) 35

(iii) 86 (iv) 93

(v) 71 (vi) 46

Answer: (i) $32^2 = (30 + 2)(30 + 2)$

$= 30(30 + 2) + 2(30 + 2)$

$= 30^2 + 30 \times 2 + 2 \times 30 + 2^2$

$= 900 + 60 + 60 + 4$

$= 1024$

(ii)For any two digit number having 5 as unit digit (lets say a5) its square is given by:

square= $a(a+1)\times 100 + 25$The number 35 has 5 in its unit's place. Therefore,

$35^2 = (3)(3 + 1)$ hundreds + 25

$= (3 \times 4)$ hundreds + 25

$= 1200 + 25 = 1225$

(iii) $86^2 = (80 + 6)(80 + 6)$

$= 80(80 + 6) + 6(80 + 6)$

$= 80^2 + 80 \times 6 + 6 \times 80 + 6^2$

$= 6400 + 480 + 480 + 36$

$= 7396$

(iv) $93^2 = (90 + 3)(90 + 3)$

$= 90\ (90 + 3) + 3\ (90 + 3)$

$= 90^2 + 90 \times 3 + 3 \times 90 + 3^2$

$= 8100 + 270 + 270 + 9$

$= 8649$

(v) $71^2 = (70 + 1)\ (70 + 1)$

$= 70\ (70 + 1) + 1\ (70 + 1)$

$= 70^2 + 70 \times 1 + 1 \times 70 + 1^2$

$= 4900 + 70 + 70 + 1$

$= 5041$

(vi) $46^2 = (40 + 6)^2$

$= 40\ (40 + 6) + 6\ (40 + 6)$

$= 402 + 40 \times 6 + 6 \times 40 + 62$

$= 1600 + 240 + 240 + 36$

$= 2116$

Question 2. Write a Pythagorean triplet whose one member is

(i) 6 (ii) 14

(iii) 16 (iv) 18

Answer: For any natural number m > 1, 2m, $m^2 - 1$, $m^2 + 1$ forms a Pythagorean triplet

Pythagorean triplet: A Pythagorean triple consists of three positive integers a, b, and c, such that $a^2 + b^2 = c^2$.

(i)

Let us take 2 m = 6

So, m = 3

Hence, the Pythagorean triplets are:

2 x 3, $3^2 - 1$, $3^2 + 1$ or 6, 8, and 10

(ii) Let 2 m = 14

m = 7

Hence, $m^2 - 1 = 49 - 1 = 48$ and $m^2 + 1 = 49 + 1 = 50$

Hence, the required Pythagorean triplet is 14, 48, and 50

(iii) Now, let 2 m = 16

m = 8

Therefore, $m^2 - 1 = 64 - 1 = 63$ and $m^2 + 1 = 64 + 1 = 65$

Therefore, the Pythagorean triplet is 16, 63, and 65

(iv) Let 2 m =18

m = 9

Thus, $m^2 - 1 = 81 - 1 = 80$ and $m^2 + 1 = 81 + 1 = 82$

Therefore, the Pythagorean triplet is 18, 80, and 82