SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Square and Square roots
Exercise 6.2

Q.1 Find the square of the following numbers

(i) 32 (ii) 35 (iii) 86

(iv) 93 (v) 71 (vi) 46

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

$= 30\,(30 + 2) + 2\,(30 + 2)$

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

$= 900 + 60 + 60 + 4$

$= 1024$

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

$= 80\,(80 + 6) + 6\,(80 + 6)$

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

$= 6400 + 480 + 480 + 36$

$= 7396$

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

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

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

$= 8100 + 270 + 270 + 9$

$= 8649$

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

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

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

$= 4900 + 70 + 70 + 1$

$= 5041$

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

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

$= 40^2 + 40 \times 6 + 6 \times 40 + 6^2$

$= 1600 + 240 + 240 + 36$

$= 2116$

Q.2 Write a Pythagorean triplet whose one member is

(i) 6 (ii) 14 (iii) 16 (iv) 18

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

(i) If we take $m^2 + 1 = 6$, then $m^2 = 5$

The value of m will not be an integer.

If we take $m^2 - 1 = 6$, then $m^2 = 7$

Again the value of m is not an integer.

Let $2m = 6$

$m = 3$

Therefore, the Pythagorean triplets are 2×3, $3^2 - 1$, $3^2 + 1$ or 6, 8, and 10.

(ii) If we take $m^2 + 1 = 14$, then $m^2 = 13$

The value of m will not be an integer.

If we take $m^2 - 1 = 14$, then $m^2 = 15$

Again the value of m is not an integer.

Let $2m = 14$

$m = 7$

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

Therefore, the required triplet is 14, 48, and 50.

(iii) If we take $m^2 + 1 = 16$, then $m^2 = 15$

The value of m will not be an integer.

If we take $m^2 - 1 = 16$, then $m^2 = 17$

Again the value of m is not an integer.

Let $2m = 16$

$m = 8$

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

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

(iv) If we take $m^2 + 1 = 18$,

$m^2 = 17$

The value of m will not be an integer.

If we take $m^2 - 1 = 18$, then $m^2 = 19$

Again the value of m is not an integer.

Let $2m = 18$ $\Rightarrow m = 9$

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

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