EXERCISE 6.2

PAGE: 98

1. Find the square of the following numbers.

i. 32

ii. 35

iii. 86

iv. 93

v. 71

vi. 46

Solution:

i. $(32)^2$

$= (30 +2)^2$

$= (30)^2 + (2)^2 + 2\times30\times2$ [Since, $(a+b)^2 = a^2+b^2 +2ab$]

$= 900 + 4 + 120$

$= 1024$

ii. $(35)^2$

$= (30+5)^2$

$= (30)^2 + (5)^2 + 2\times30\times5$ [Since, $(a+b)^2 = a^2+b^2 +2ab$]

$= 900 + 25 + 300$

$= 1225$

iii. $(86)^2$

$= (90 - 4)^2$

$= (90)^2 + (4)^2 - 2\times90\times4$ [Since, $(a+b)^2 = a^2+b^2 +2ab$]

$= 8100 + 16 - 720$

$= 8116 - 720$

$= 7396$

iv. $(93)^2$

$= (90+3)^2$

$= (90)^2 + (3)^2 + 2\times90\times3$ [Since, $(a+b)^2 = a^2+b^2 +2ab$]

$= 8100 + 9 + 540$

$= 8649$

v. $(71)^2$

= $(70+1)^2$

= $(70)^2 + (1)^2 + 2\times70\times1$ [Since, $(a+b)^2 = a^2+b^2+2ab$]

= 4900 + 1 + 140

= 5041

vi. $(46)^2$

= $(50-4)^2$

= $(50)^2 + (4)^2 - 2\times50\times4$ [Since, $(a+b)^2 = a^2+b^2+2ab$]

= 2500 + 16 – 400

= 2116

2. Write a Pythagorean triplet whose one member is.

i. 6

ii. 14

iii. 16

iv. 18

Solution:

For any natural number m, we know that 2m, m^2-1, m^2+1 is a Pythagorean triplet.

i. 2m = 6

⇒ m = 6/2 = 3

$m^2-1 = 3^2 - 1 = 9-1 = 8$

$m^2+1 = 3^2+1 = 9+1 = 10$

∴ (6, 8, 10) is a Pythagorean triplet.

ii. 2m = 14

⇒ m = 14/2 = 7

$m^2-1 = 7^2-1 = 49-1 = 48$

$m^2+1 = 7^2+1 = 49+1 = 50$

∴ (14, 48, 50) is not a Pythagorean triplet.

iii. 2m = 16

⇒ m = 16/2 = 8

$m^2-1 = 8^2-1 = 64-1 = 63$

$m^2+1 = 8^2+1 = 64+1 = 65$

∴ (16, 63, 65) is a Pythagorean triplet.

iv. 2m = 18

$\Rightarrow m = 18/2 = 9$

$m^2-1 = 9^2-1 = 81-1 = 80$

$m^2+1 = 9^2+1 = 81+1 = 82$

$\therefore$ (18, 80, 82) is a Pythagorean triplet.