

Mathematics

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(Chapter – 6) (Squares and Square Roots)

(Class - VIII)

Exercise 6.2

Question 1:

Find the squares of the following numbers:

- (i) 32
- (ii) 35
- (iii) 86
- (iv) 93
- (v) 71
- (vi) 46

Answer 1:

$$(i) \quad (32)^2 = (30+2)^2 = (30)^2 + 2 \times 30 \times 2 + (2)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 900 + 120 + 4 = 1024$$

$$(ii) \quad (35)^2 = (30+5)^2 = (30)^2 + 2 \times 30 \times 5 + (5)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 900 + 300 + 25 = 1225$$

$$(iii) \quad (86)^2 = (80+6)^2 = (80)^2 + 2 \times 80 \times 6 + (6)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 1600 + 960 + 36 = 7386$$

$$(iv) \quad (93)^2 = (90+3)^2 = (90)^2 + 2 \times 90 \times 3 + (3)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 8100 + 540 + 9 = 8649$$

$$(v) \quad (71)^2 = (70+1)^2 = (70)^2 + 2 \times 70 \times 1 + (1)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 4900 + 140 + 1 = 5041$$

$$(vi) \quad (46)^2 = (40+6)^2 = (40)^2 + 2 \times 40 \times 6 + (6)^2 \quad [\because (a+b)^2 = a^2 + 2ab + b^2]$$
$$= 1600 + 480 + 36 = 2116$$

Question 2:

Write a Pythagoras triplet whose one member is:

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

Answer 2:

(i) There are three numbers $2m, m^2 - 1$ and $m^2 + 1$ in a Pythagorean Triplet.

$$\text{Here, } 2m = 6 \quad \Rightarrow \quad m = \frac{6}{2} = 3$$

Therefore,

$$\text{Second number } (m^2 - 1) = (3)^2 - 1 = 9 - 1 = 8$$

$$\text{Third number } m^2 + 1 = (3)^2 + 1 = 9 + 1 = 10$$

Hence, Pythagorean triplet is (6, 8, 10).

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(ii) There are three numbers $2m, m^2 - 1$ and $m^2 + 1$ in a Pythagorean Triplet.

Here, $2m = 14$

$$\Rightarrow m = \frac{14}{2} = 7$$

Therefore,

$$\text{Second number } (m^2 - 1) = (7)^2 - 1 = 49 - 1 = 48$$

$$\text{Third number } m^2 + 1 = (7)^2 + 1 = 49 + 1 = 50$$

Hence, Pythagorean triplet is (14, 48, 50).

(iii) There are three numbers $2m, m^2 - 1$ and $m^2 + 1$ in a Pythagorean Triplet.

Here, $2m = 16$

$$\Rightarrow m = \frac{16}{2} = 8$$

Therefore,

$$\text{Second number } (m^2 - 1) = (8)^2 - 1 = 64 - 1 = 63$$

$$\text{Third number } m^2 + 1 = (8)^2 + 1 = 64 + 1 = 65$$

Hence, Pythagorean triplet is (16, 63, 65).

(iv) There are three numbers $2m, m^2 - 1$ and $m^2 + 1$ in a Pythagorean Triplet.

Here, $2m = 18$

$$\Rightarrow m = \frac{18}{2} = 9$$

Therefore,

$$\text{Second number } (m^2 - 1) = (9)^2 - 1 = 81 - 1 = 80$$

$$\text{Third number } m^2 + 1 = (9)^2 + 1 = 81 + 1 = 82$$

Hence, Pythagorean triplet is (18, 80, 82).