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Changing your Tomorrow

SQUARES AND SQUARE ROOTS

PERIOD 5

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 3
CHAPTER NAME : SQUARES AND SQUARE ROOTS

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Learning outcome

- Students will be able to find the perfect square
- Students will be able to find the square root of a perfect square number using prime factor method.
- Students will be able to find the square root of a perfect square using division method.
- Students will be able to find the square root of a number which is not a perfect square using division method

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Exercise- 3(C)

Question 13.

Without doing the actual addition, find the sum of:

(i) 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23

(ii) 1 + 3 + 5 + 7 + 9 + ... + 39 + 41

(iii) 1 + 3 + 5 + 7 + 9 + ... + 51 + 53

Sol:

(i) 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 +23

= Sum of first 12 odd natural numbers = 12^2 = 144

(ii) 1+3 + 5 + 7 + 9 + ... + 39 + 41

= Sum of first 21 odd natural numbers = 21^2 = 441

(iii) 1 + 3 + 5 + 7 + 9 + ... + 51 + 53

= Sum of first 27 odd natural number = 27^2 = 729

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(*i*) $37^2 - 36^2$

Using property, for any natural number n,

$(n + 1)^2 - n^2 = (n + 1) + n$

$\Rightarrow (36 + 1)^2 - 36^2 = (36 + 1) + 36$

$\Rightarrow 37^2 - 36^2 = 37 + 36$

$\Rightarrow 37^2 - 36^2 = 73$

(*ii*) $85^2 - 84^2$

Using property, for any natural number n,

$(n + 1)^2 - n^2 = (n + 1) + n$

$\Rightarrow (84 + 1)^2 - 84^2 = (84 + 1) + 84$

$\Rightarrow 85^2 - 84^2 = 85 + 84$

$\Rightarrow 85^2 - 84^2 = 169$

(*iii*) $101^2 - 100^2$

Using property, for any natural number n,

$(n + 1)^2 - n^2 = (n + 1) + n$

$\Rightarrow (100 + 1)^2 - 100^2 = (100 + 1) + 100$

$\Rightarrow 101^2 - 100^2 = 101 + 100$

$\Rightarrow 101^2 - 100^2 = 201$

Question 14.

Write three sets of Pythagorean triplets such that each set has numbers less than 30.

Sol:

The three sets of Pythagorean triplets such that each set has numbers less than 30 are 3, 4 and 5; 6, 8 and 10; 5, 12 and 13

Proof:

In 3, 4 and 5

$3^2 + 4^2 = 5^2$

$\Rightarrow 9 + 16 = 25$

$\Rightarrow 25 = 25$

In 6, 8 and 10

$6^2 + 8^2 = 10^2$

$\Rightarrow 36 + 64 = 100$

$\Rightarrow 100 = 100$

In 5, 12, and 13

$5^2 + 12^2 = 13^2$

$\Rightarrow 25 + 144 = 169$

$\Rightarrow 169 = 169$

Home assignment

1. **What is the least number that should be added to 6200 to make it a perfect square?**
2. **Find the least number of four digits that is a perfect square.**

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