

Q.1. $(a-b)^2 = (a-b)(a-b)$

$$= (a)(a) + (a)(-b) + (-b)(a) + (-b)(-b)$$

$$= a^2 - ab - ba + b^2$$

$$= a^2 - ab - ab + b^2$$

$$= a^2 - 2ab + b^2$$

$\therefore (a-b)^2 = a^2 - 2ab + b^2$

Q.2. Let 'x' be any integer. $\Rightarrow 2x$ is an even integer
 Let 'y' be any integer. $\Rightarrow 2y$ is an even integer
 and 'y' is any integer. $\Rightarrow 2y+1$ is an odd integer.

We need product of an even and an odd integer
 Now

i.e. $(2x)(2y+1) = (2x)(2y) + (2x)(1)$

$$= 4xy + 2x$$

$$= \text{even} + \text{even}$$

$$= \text{even}$$

$\therefore (2x)(2y+1) = \text{even}$

\downarrow \downarrow
 (An even int.) (An odd int.) = even

Q.3 Let 'x' be any integer. \Rightarrow '2x' is an even integer.

\Rightarrow '2x+1' is an odd integer.

We need square of an odd integer.

$$\text{i.e. } (2x+1)^2 = (2x+1)(2x+1)$$

$$= (2x)(2x) + (2x)(1) + (1)(2x) + (1)(1)$$

$$= 4x^2 + 2x + 2x + 1$$

$$= 4x^2 + 4x + 1$$

$$= 4(x^2 + x) + 1$$

$$= \text{Even} + \text{odd}$$

$$= \text{odd}$$

$$\therefore (2x+1)^2 = \text{odd}$$

Q.4 Let x be any integer.

Then $x-2, x-1, x, x+1, x+2$ can be considered as five consecutive integers.

As 'x' is in the middle, it is the median of these numbers.

Now, we need sum of five consecutive integers.

$$\text{i.e. } (x-2) + (x-1) + (x) + (x+1) + (x+2) = x+x+x+x+x - 2 - 1 + 1 + 2$$

$$= 5x - 3 + 3$$

$$= 5x$$

$$= 5(\text{Median})$$

$$\therefore (x-2) + (x-1) + (x) + (x+1) + (x+2) = 5(\text{Median})$$

In other words, sum of five consecutive integers is 5 times the median.

Q.5. Let x be any integer.

Then $x-3, x-2, x-1, x, x+1, x+2, x+3$ can be considered as seven consecutive integers.

As ' x ' is in the middle, it is the median of these numbers.

Now, we need sum of seven consecutive integers.

$$\text{i.e. } (x-3) + (x-2) + (x-1) + x + (x+1) + (x+2) + (x+3) = x+x+x+x+x+x+x-3-2-1+1+2+3$$

$$= 7x - 6 + 6$$

$$= 7x$$

$$= 7(\text{Median})$$

$$\therefore (x-3) + (x-2) + (x-1) + x + (x+1) + (x+2) + (x+3) = 7(\text{Median})$$

i.e. Sum of seven consecutive integers is 7 times the median.

Q.6. Sun sets in west everyday of the week.

Today is Monday (the first day of week)

therefore the sun will set in west today as well.