

MATHEMATICS

TERM-1

Q Derive the relationship between zeroes and coefficients of quadratic polynomial and verify it with any suitable example.

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10th - A

Relationship between zeroes and coefficients :

Standard form : $ax^2 + bx + c$

Zeroes : α and β

Relations :

1. Sum of zeroes

$$\alpha + \beta = -\frac{b}{a}$$

2. Product of zeroes

$$\alpha\beta = \frac{c}{a}$$

Verification with an example :

$$x^2 - 5x + 6$$

Middle-term splitting :

$$x^2 - 5x + 6 = 0$$

$$x^2 - 3x - 2x + 6 = 0$$

$$x(x-3) - 2(x-3) = 0$$

$$(x-3)(x-2) = 0$$

$$x-3 = 0$$

$$x = 3$$

α

$$x-2 = 0$$

$$x = 2$$

β

$$\therefore \alpha = 3, \beta = 2$$

Verifying relations

1. Sum of zeroes

$$\alpha + \beta = -\frac{b}{a}$$

$$3 + 2 = -\frac{(-5)}{1}$$

$$5 = 5$$

\therefore Proved

2. Product of zeroes

$$\alpha\beta = \frac{c}{a}$$

$$3 \times 2 = \frac{6}{1}$$

$$6 = 6$$

\therefore Proved

MATHEMATICS

TERM - 2

Q Area of circle by coiling method

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- Aim: To find formula of area of circle by coiling method
- Materials required:
Cardboard, thick sheet of paper, pair of scissors, adhesive, marker, ruler, pencil, geometry box with instruments, thread
- Procedure:
 - » Stick the sheet of paper on cardboard.
 - » Construct a circle of radius 3.5 cm.
 - » Take a thread and paste it along the circle with no gap in between. Fill the whole area of circle with thread.
 - » Cut the pasted thread from any point on circumference to the centre. (Cut the radius, in simple terms).
 - » Open all threads and arrange them in a straight line, forming a triangle.

- Observation:

The area of circle is equal to the area of triangle formed [∵ same thread was used].

Base of triangle = Circumference of circle
[∵ both were made of the same (largest) thread].

Height of triangle = Radius of circle

$$\text{Area of Triangle} = \frac{1}{2} \times b \times h$$

$$= \frac{1}{2} \times 2\pi r \times r$$

$$\rightarrow = \underline{\underline{\pi r^2}}$$

∴ $\text{Area of circle} = \pi r^2$ [∵ Area of Δ = Area of \bigcirc]

- Conclusion: Formula for a circle's area is πr^2 .