

Understanding Heron's Formula

Chapter 10: Heron's Formula · Topic 1

Key Concept

For example, for a triangle with sides 5, 6, 7, the semi-perimeter is $s = (5+6+7)/2 = 9$, and the area is $\sqrt{(9 \times (9-5) \times (9-6) \times (9-7))} = \sqrt{(9 \times 4 \times 3 \times 2)} = \sqrt{216} \approx 14.7$ square units. This formula, attributed to the ancient Greek mathematician Heron of Alexandria, works for any triangle (not just right triangles), making it a versatile tool whenever three side lengths are known but the height is not.

Quick Revision Notes

- Heron's Formula: $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$, where $s = (a+b+c)/2$ (semi-perimeter).
- This formula uses only the three side lengths, no height needed.
- Example: sides 5,6,7 give semi-perimeter 9 and area $\sqrt{216} \approx 14.7$ sq units.
- Heron's Formula works for any triangle, not just right triangles.

Practice Questions

- 1 Find the semi-perimeter of a triangle with sides 5,6,7.
- 2 Find the area of a triangle with sides 3,4,5 using Heron's formula.
- 3 Explain when Heron's formula is especially useful compared to the standard area formula ($\frac{1}{2} \times \text{base} \times \text{height}$).