# SOME SPECIAL CASES OF FINDING THE AREA OF A TRAPEZONE

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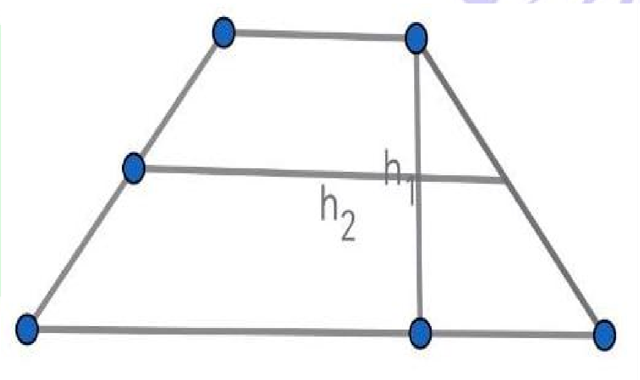
**Abstract:** This paper explores specific cases and alternative methods for calculating the area of a trapezoid. While the standard formula based on bases and height is universal, certain geometric constraints—such as known diagonals, midsegments, or specific angles in isosceles and right-angled trapezoids—allow for more streamlined approaches. The study analyzes these "special cases," providing simplified mathematical derivations and highlighting their practical applications in geometry education and engineering calculations. The findings aim to enhance the efficiency of solving complex geometric problems by utilizing inherent figure properties.

**Keywords:** Trapezoid area, special cases, geometric derivations, isosceles trapezoid, right-angled trapezoid, diagonals, midsegment.

We know from school that there are many ways to find the area of a trapezoid. For example, the simplest formula is as follows:

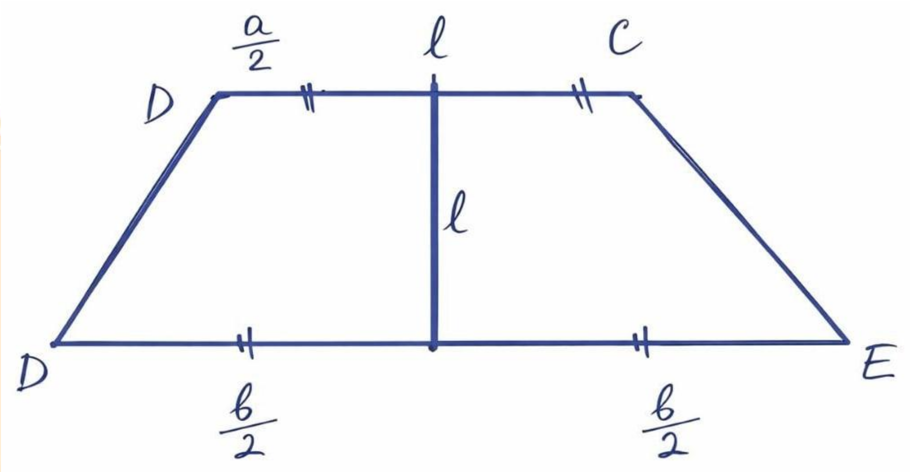



Middleline

h - height $S = k*h = \frac{a+b}{2} * h$

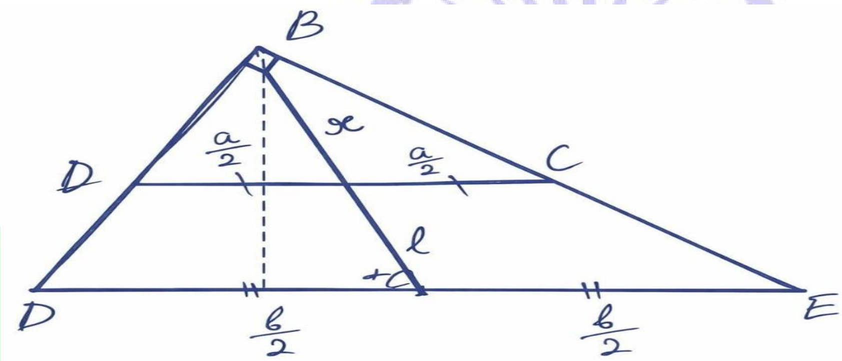
The line joining the midpoints of the sides of a trapezoid is called its midpoint. The line joining the midpoints of the bases of a trapezoid is currently being proposed in articles as its second midpoint. Below, we will learn how to find the area of a triangle formed by joining the sides of a large trapezoid, given the angle α between the second midpoint of the trapezoid and the base, the small and large bases, and the angle 90°.

It is known from school that the median drawn from the right angle of a right triangle is equal to half the hypotenuse.




$$S_{ABC}=\frac{a}{2}*x*\sin a*\ \ 2*\frac{1}{2}=\frac{a}{2}*\ x*\ \ \sin a=\frac{a^2}{4}\sin a$$

$$S_{DBE}=\frac{b}{2}*\ (l+x)*\ \ \sin a*\ \ 2*\frac{1}{2}=\frac{b^2}{4}\sin a$$




$$S_{ACED}=\frac{b^2}{4}\sin a-\frac{a^2}{4}\sin a=\frac{b^2-a^2}{4}\sin a$$

That is why $x=\frac{a}{2}$ va $(x+l)=\frac{b}{2}$ will be.

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