



CLASS 10 ACADEMIC PROGRAM-2020

GENERAL MATH

Lecture : M-40

Chapter 15 : Area Related Theorems and Constructions

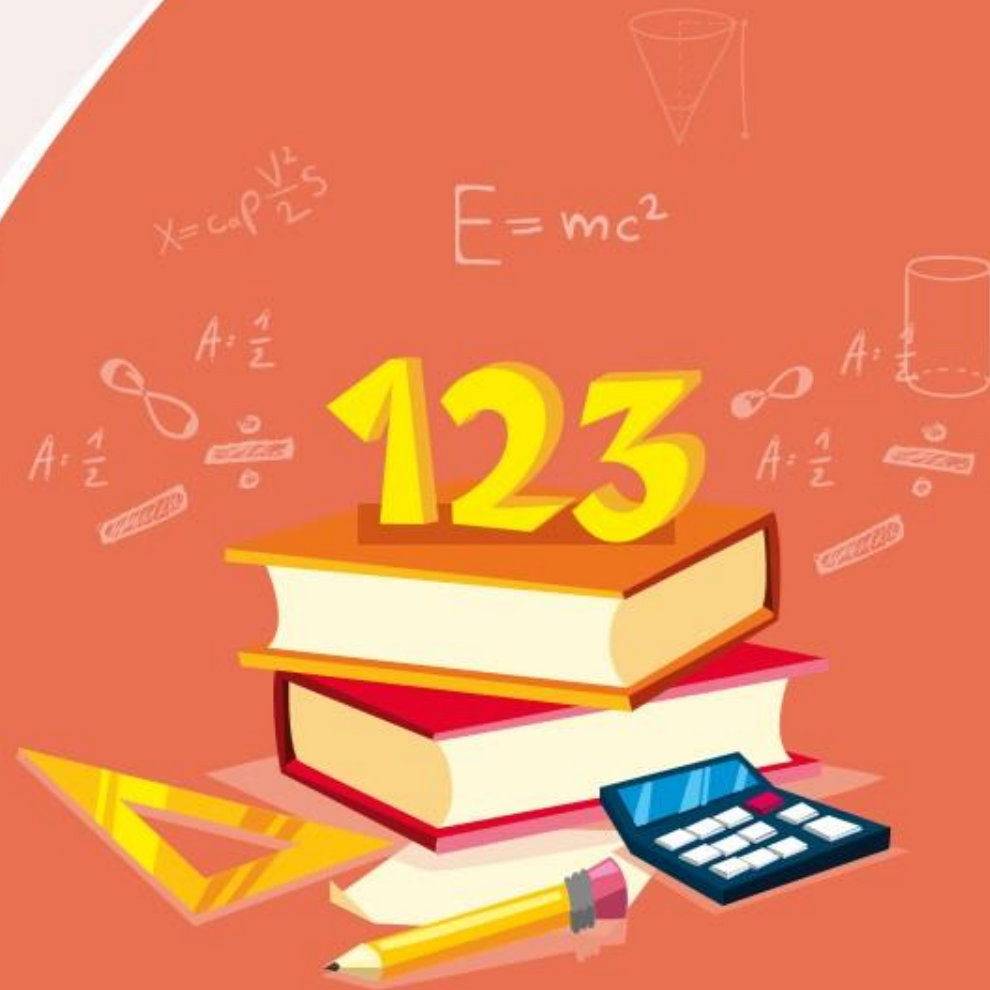


$$x = \sqrt{\frac{6^2}{c} + c} - \frac{b}{2}$$



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POLL QUESTION -01

❑ The area of ABC and DEF are equal. So we can say that ABC and DEF must be congruent.

(a) True

(b) False

POLL QUESTION -02

☐ ABC and DEF are congruent. So the area of ABC and DEF are must be equal.

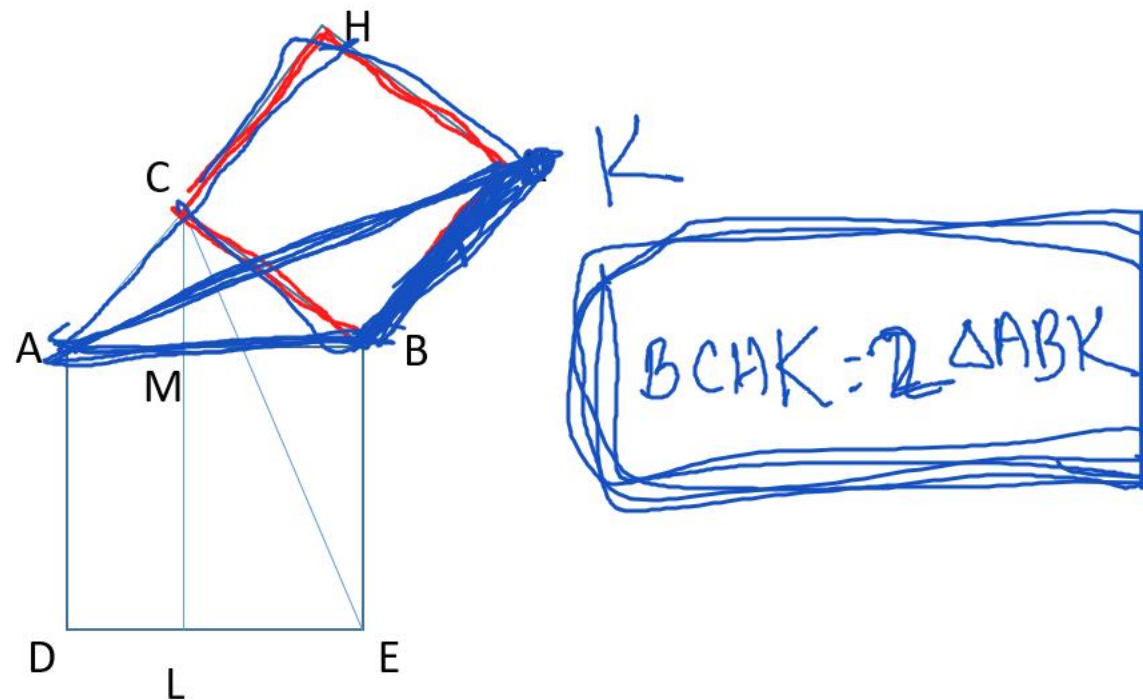
(a) True

(b) False

POLL QUESTION -03

□ ABC is a Right Angled triangle, $\angle ACB=90^\circ$. BCHK and ABED are two squares. $CL \perp DE$. What is the area of BCHK?

- (a) ΔBCM
- (b) $\square BCLE$
- (c) ΔABK
- (d) $2 \times \Delta ABK$



POLL QUESTION -04

□ ABC is a Right Angle triangle, $\angle ACB=90^\circ$. BCHK and ABED are two squares. If $CL \perp DE$ then what will be the value of $(2 \times \Delta BCE)$?

(a) □BMLE ✓

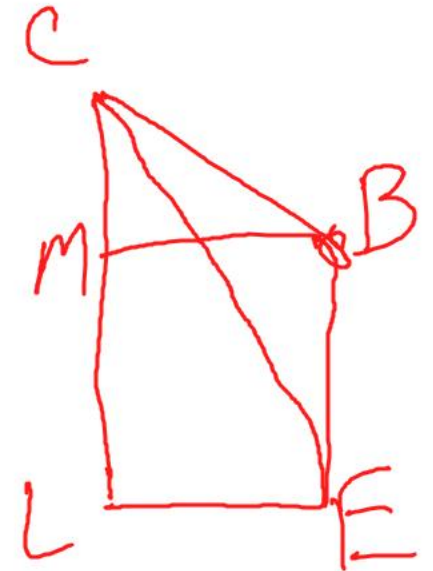
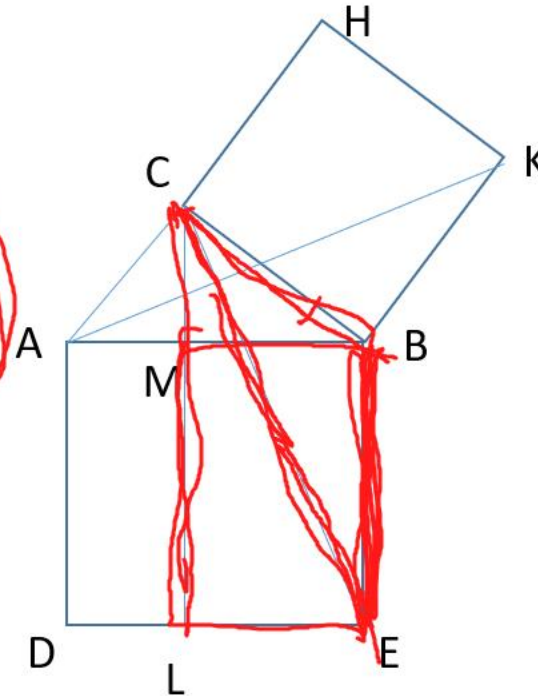
(b) ΔBME ✓

(c) $2 \times \square BMLE$ ✓

(d) $2 \times \square BCLE$ ✓

$$2\Delta BCE = \square BMLE$$

$$2\Delta BCE = \square BMLE$$

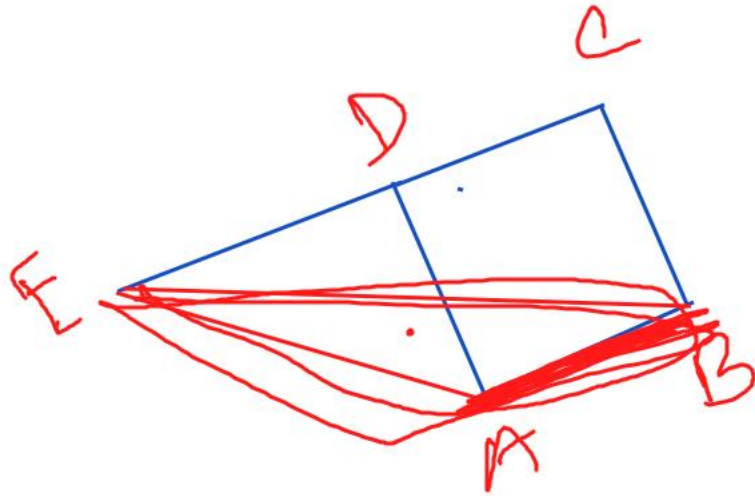


THEOREM 36

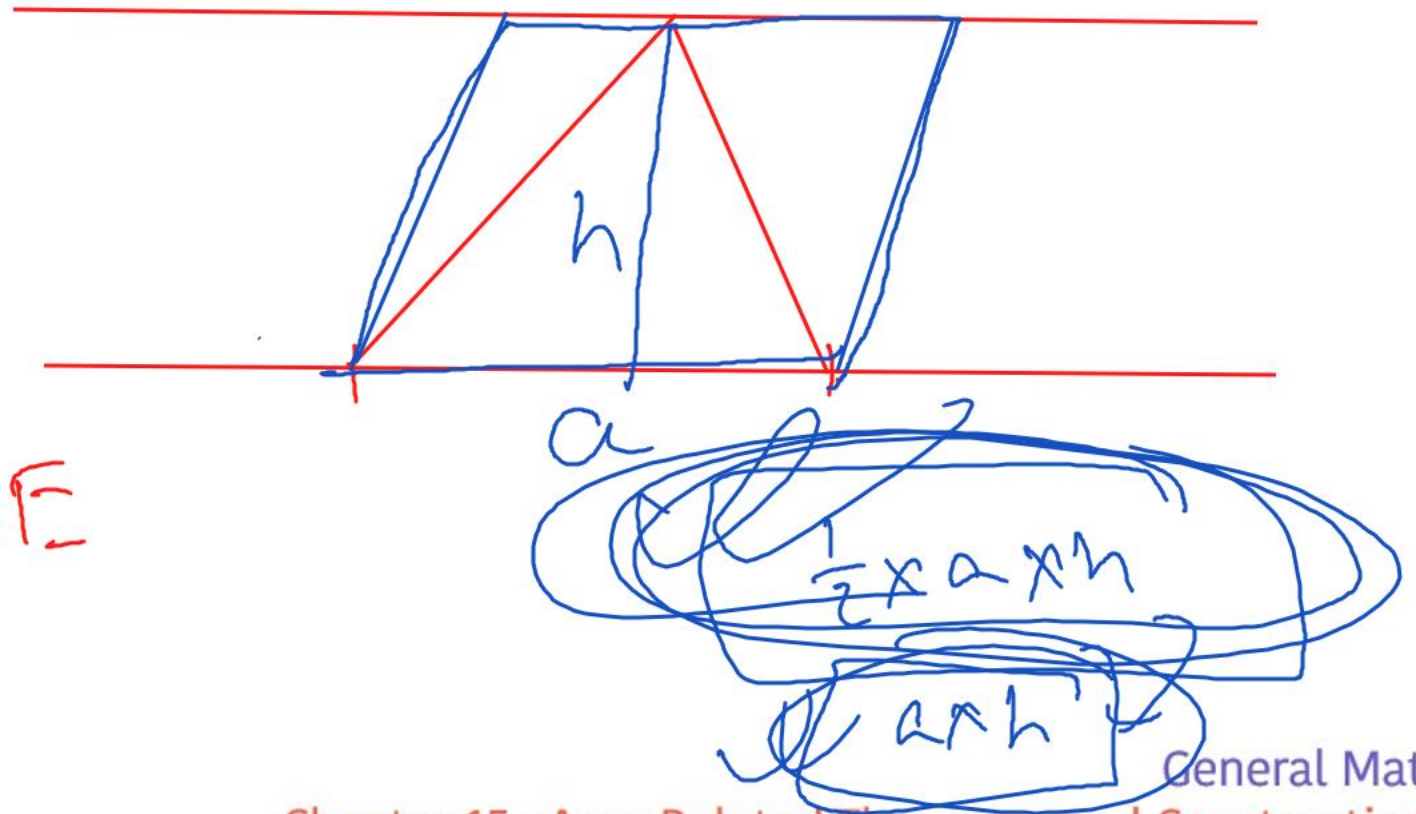
- Area of all the triangular regions having same base and lying between the same pair of parallel lines are equal to one another.

THEOREM 37

- Area of a triangle is exactly half of the area of a parallelogram lying on the same base and between the same pair of parallel lines as the triangle.

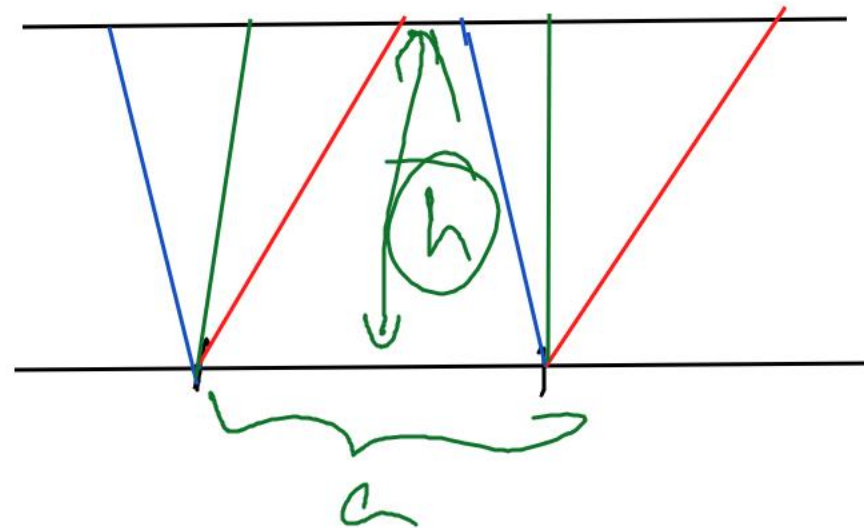


$$ABCD = 2 \times ABE$$



THEOREM 38

- Parallelograms lying on the same base and between the same pair of parallel lines are of equal area.



THEOREM 39

➤ Pythagoras Theorem:

$$2\triangle BCE \Rightarrow 2\triangle ABK = \square BCHK$$

$$\Rightarrow (2\triangle BCE) = \square BMLE$$

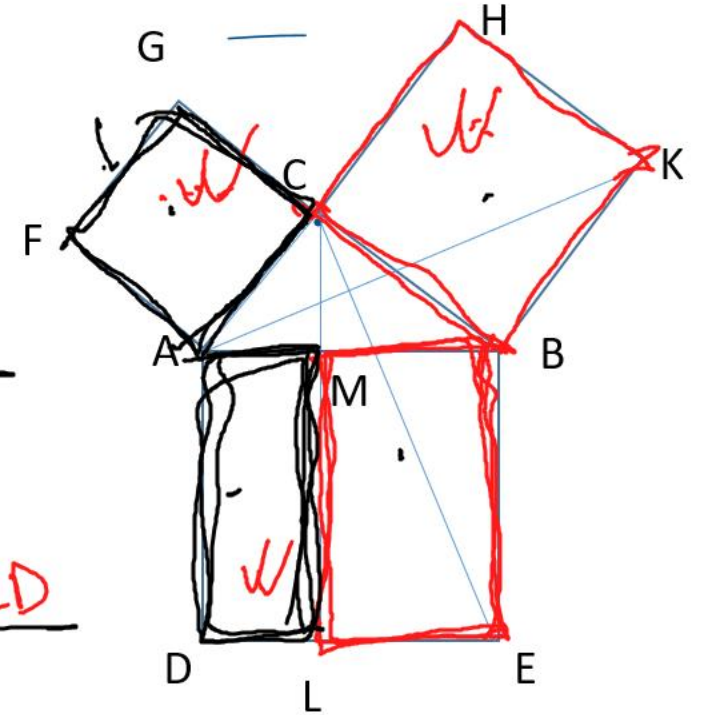
$$\therefore \square BCHK = \square BMLE$$

Similarly,

$$\square ACGF = \square AMLD$$

$$\therefore \square ACGF + \square BCHK = \square BMLE + \square AMLD$$

$$= \square ABED \quad [\text{Proved}]$$



$\triangle ABK$ & $\triangle BCE$,

$$AB = BE$$

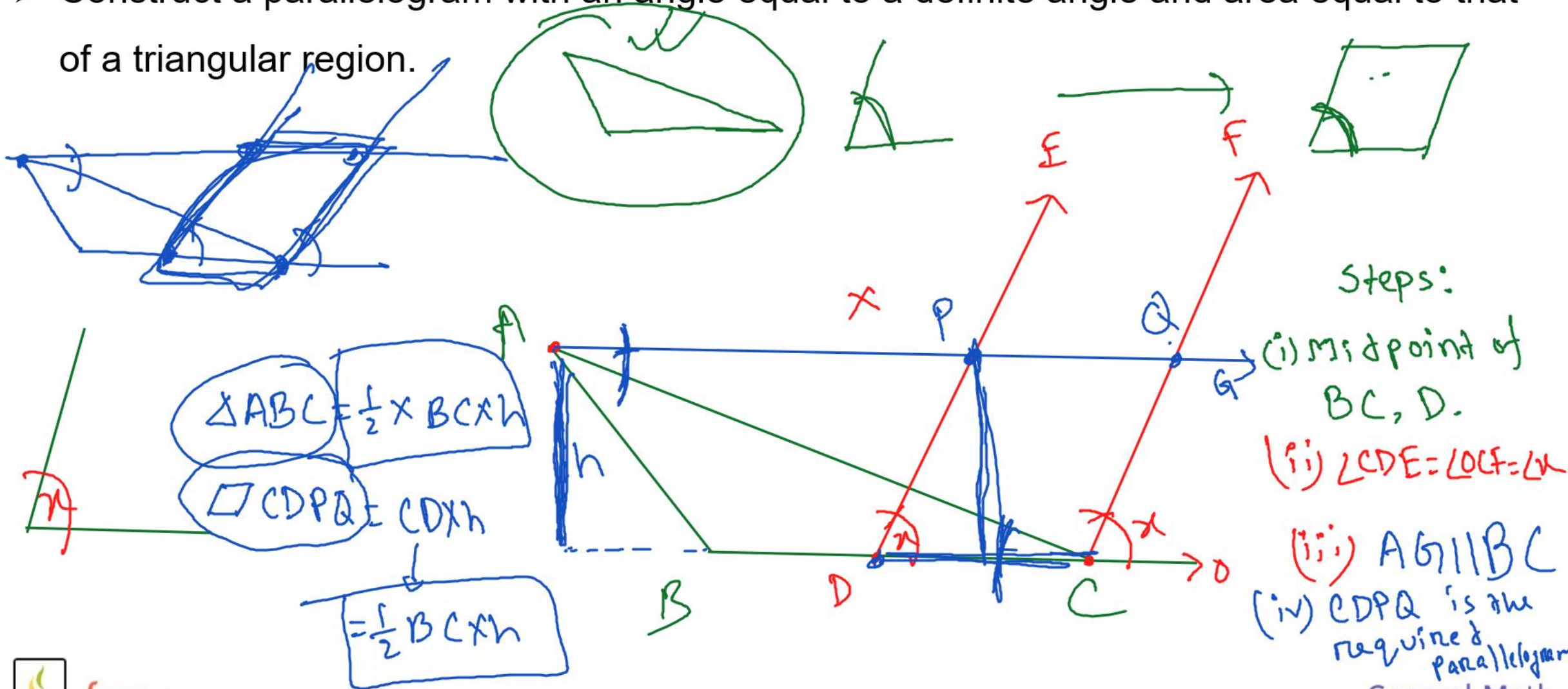
$$BK = BC$$

$$\angle ABK = \angle CBE$$

$$\therefore \triangle ABK \cong \triangle BCE \quad [SAS]$$

CONSTRUCTION 13

- Construct a parallelogram with an angle equal to a definite angle and area equal to that of a triangular region.



CONSTRUCTION 14

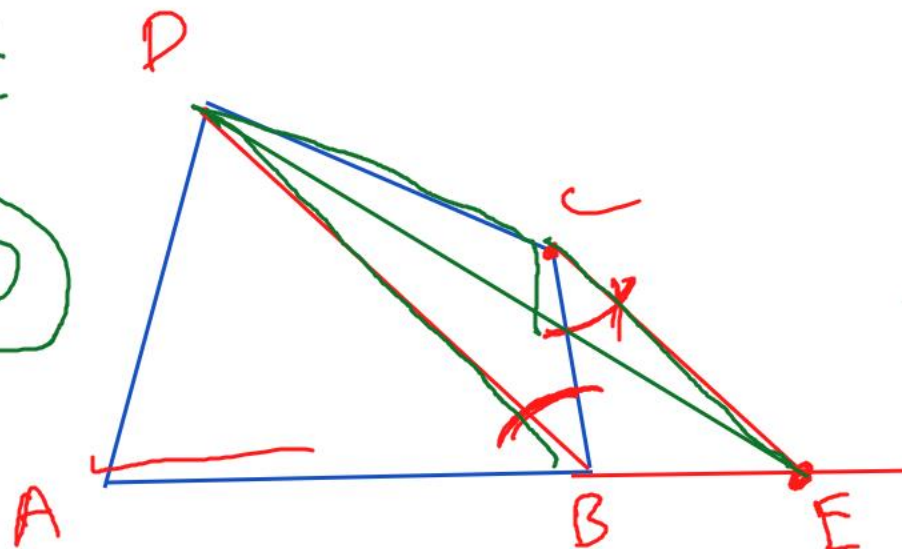
- Construct a triangle with area of the triangular region equal to that of a quadrilateral region.

$$\triangle BDE = \triangle BCD$$

Proof: $\triangle ADE = \triangle ABD + \triangle BDE$

$$= \triangle ABD + \triangle BCD$$

$$= \square ABCD$$

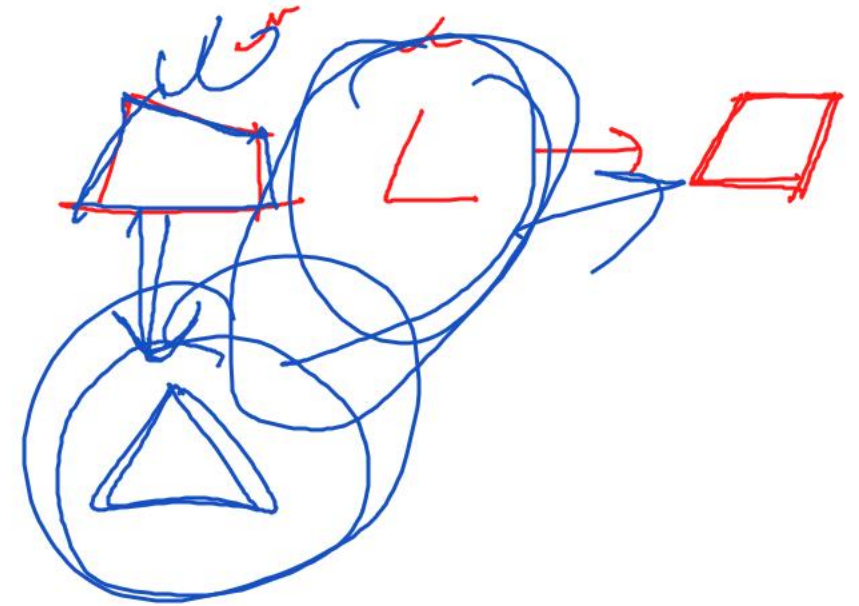
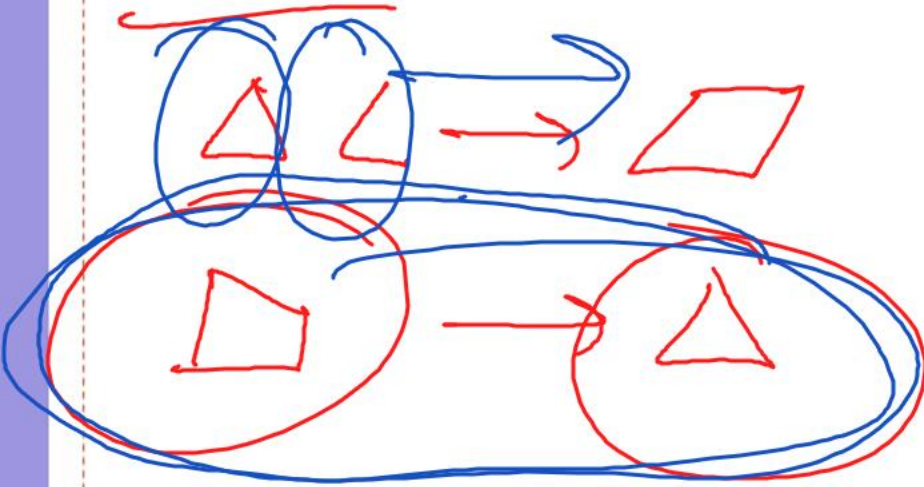


- Steps:
- (i) B, D join
 - (ii) $BD \parallel CE$
 - (iii) D, E join
 - (iv) ADE is the required triangle

General Math

CONSTRUCTION 15

Construct a parallelogram, with a given angle and the area of the bounded region equal to that of a quadrilateral region.



EXERCISE-15

5. Prove that, the diagonals of a parallelogram divide the parallelogram into four equal triangular regions.

6. Prove that, the area of a square is half the area of the square drawn on its diagonal.

7. Prove that, any median of a triangle divides the triangular region into two regions of equal area.

8. A parallelogram and a rectangular region of equal area lie on the same side of the bases.
Show that, the perimeter of the parallelogram is greater than that of the triangle.

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ধ্বংস করে

$$X = \frac{c \rho \sqrt{2}}{2} S$$

$$X = \frac{c \rho \sqrt{2}}{2} S$$

$$E = mc^2$$

$$x = \sqrt{\frac{a^2}{c} + c} - \frac{b}{2}$$



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