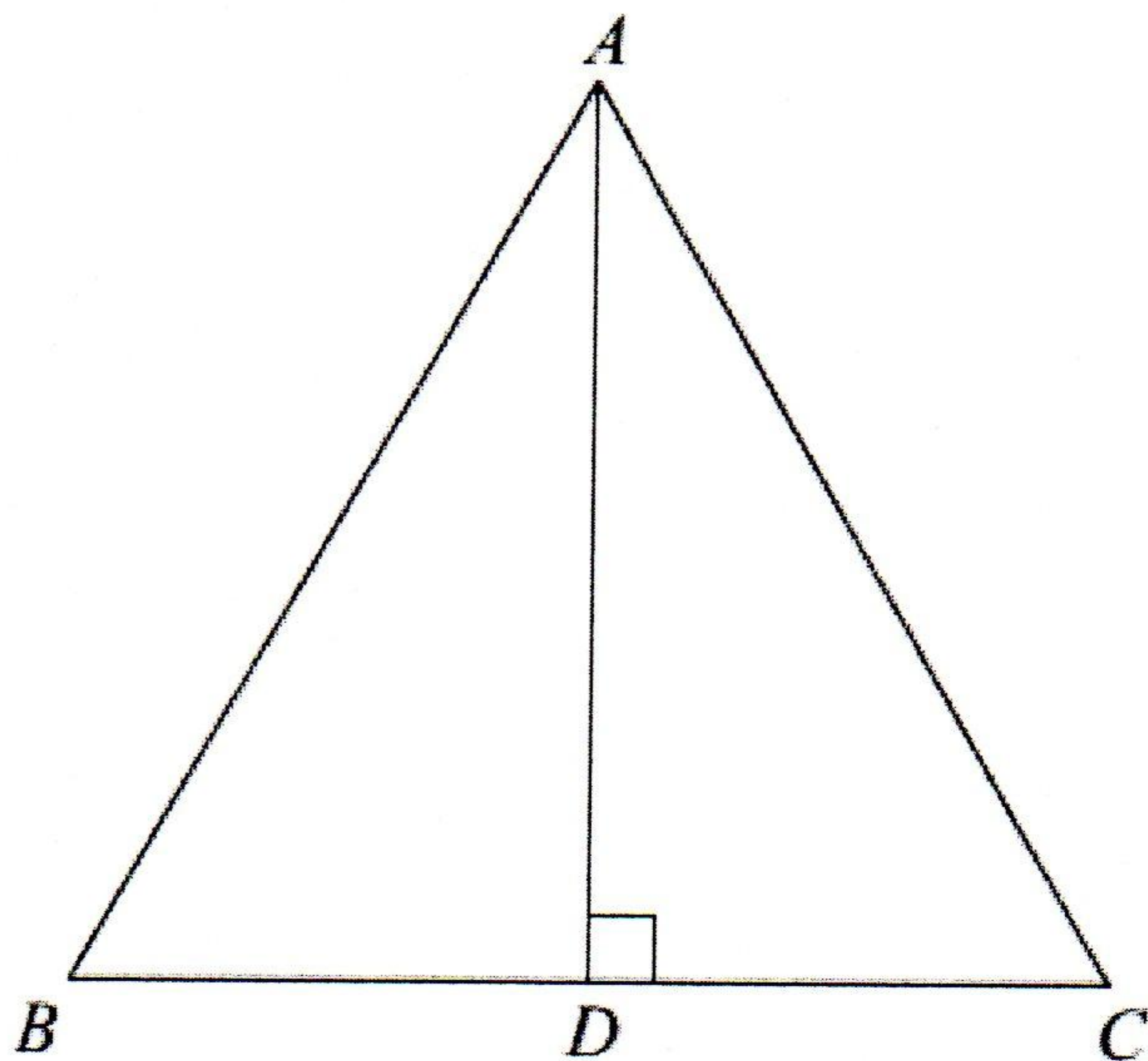


Geometric proof

Q1. ABC is an equilateral triangle.

D lies on BC .

AD is perpendicular to BC .

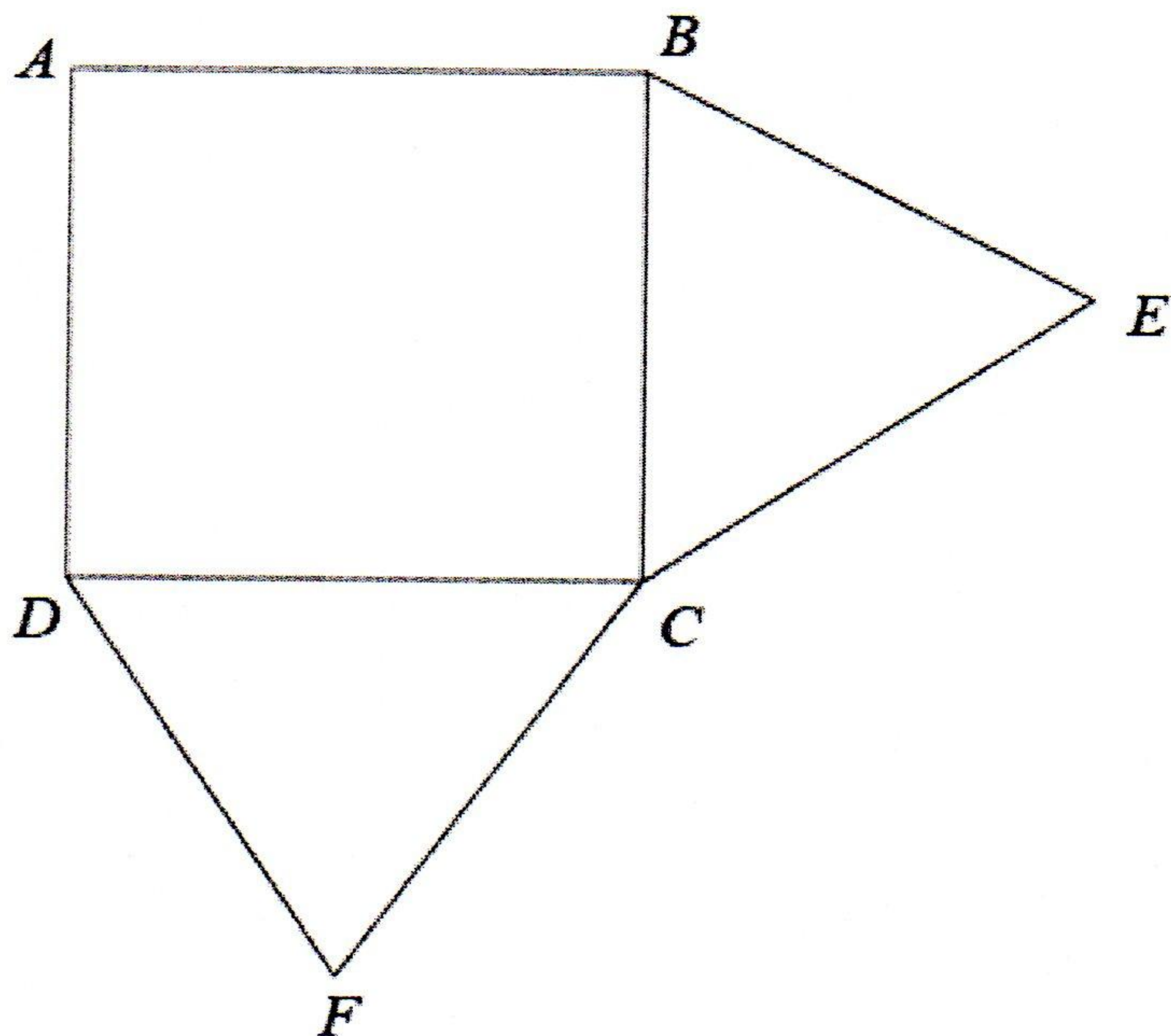


(a) Prove that triangle ADC is congruent to triangle ADB .

(b) Hence, prove that $BD = \frac{1}{2} AB$.

Q2. $ABCD$ is a square.

BEC and DCF are equilateral triangles.

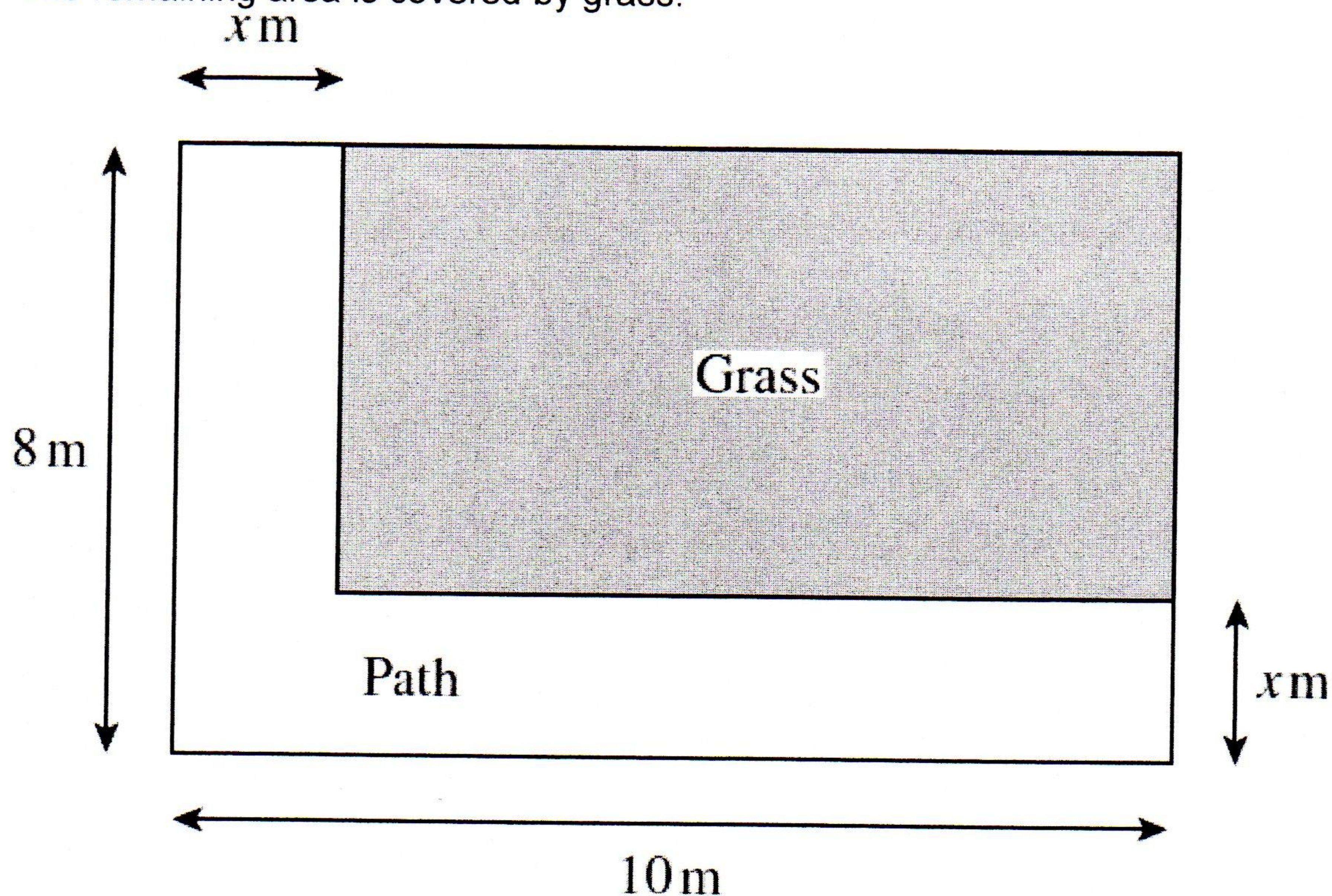


(a) Prove that triangle ECD is congruent to triangle BCF .

G is the point such that $BEGF$ is a parallelogram.

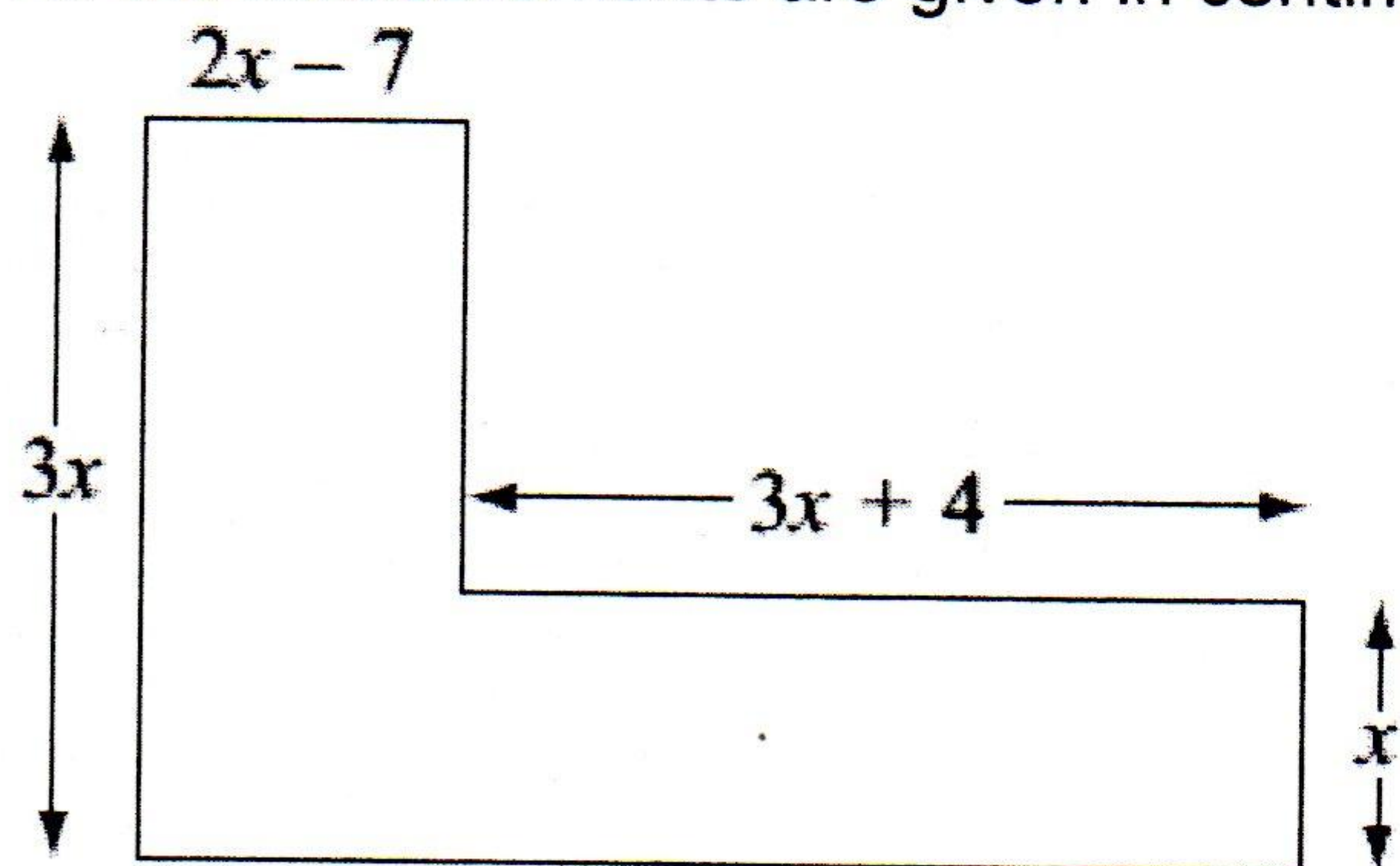
(b) Prove that $ED = EG$

Q3. The diagram shows a garden in the shape of a rectangle measuring 10 m by 8 m. On two sides of the garden there is a path x metres wide. The remaining area is covered by grass.



The area covered by grass is $\frac{3}{5}$ of the area of the garden.
 Show that x satisfies the equation $x^2 - 18x + 32 = 0$
 Hence, or otherwise, find the width of the path.

Q4. The diagram shows a 6-sided shape.
 All the corners are right angles.
 All the measurements are given in centimetres.

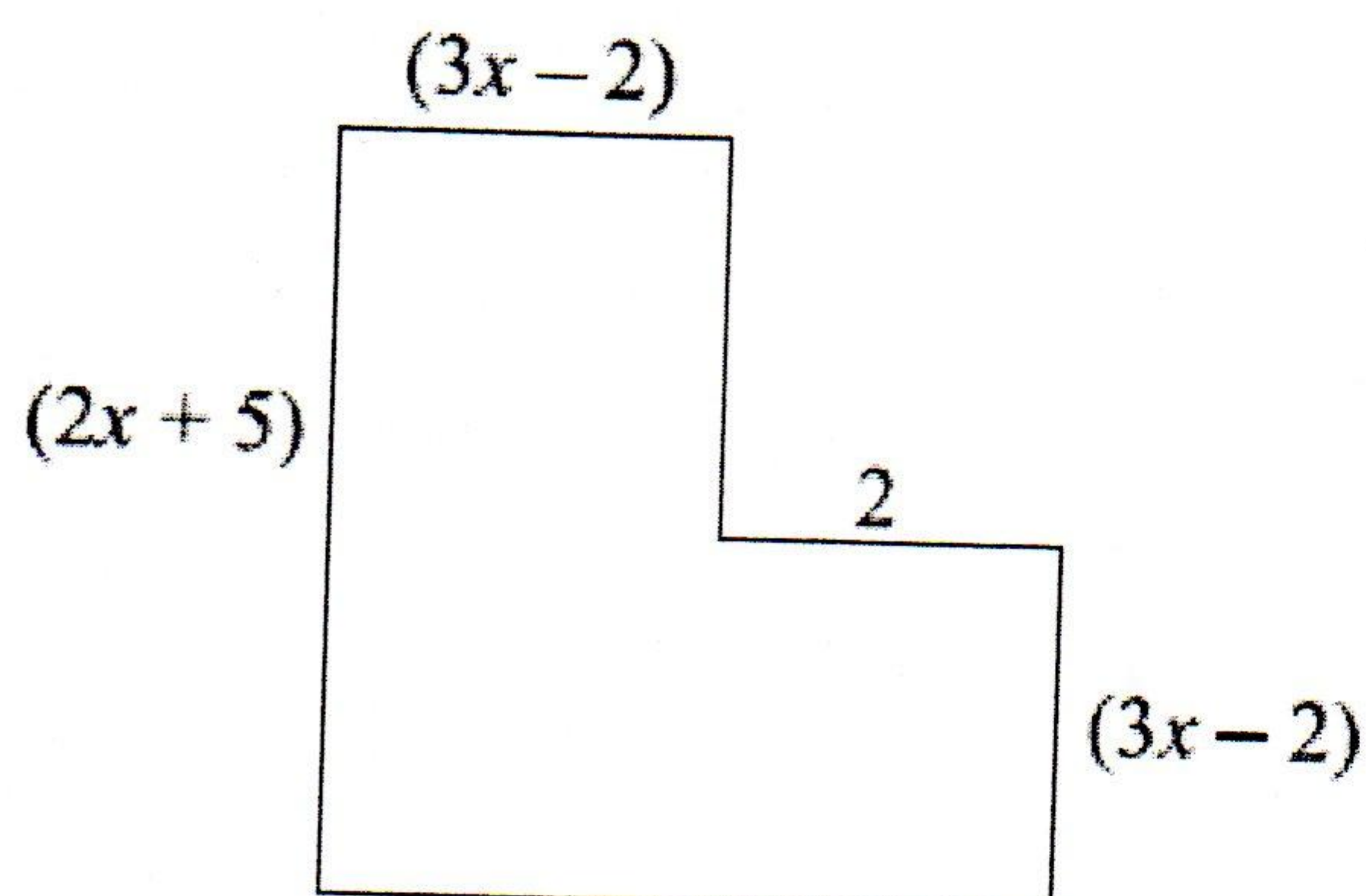


a) Find the area of the shape in algebraic expression and simplify into simplest form.

b) The area of the shape is 85 cm^2 . Make equation and solve the equation.
 Give your solutions correct to 3 significant figures.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$

Q5. The diagram below shows a 6-sided shape.



All the corners are right angles. All measurements are given in centimetres.
The area of the shape is 25 cm^2 .

(a) Show that $6x^2 + 17x - 39 = 0$

(b) (i) Solve the equation

$$6x^2 + 17x - 39 = 0$$

$x = \dots\dots\dots$ or $x = \dots\dots\dots$

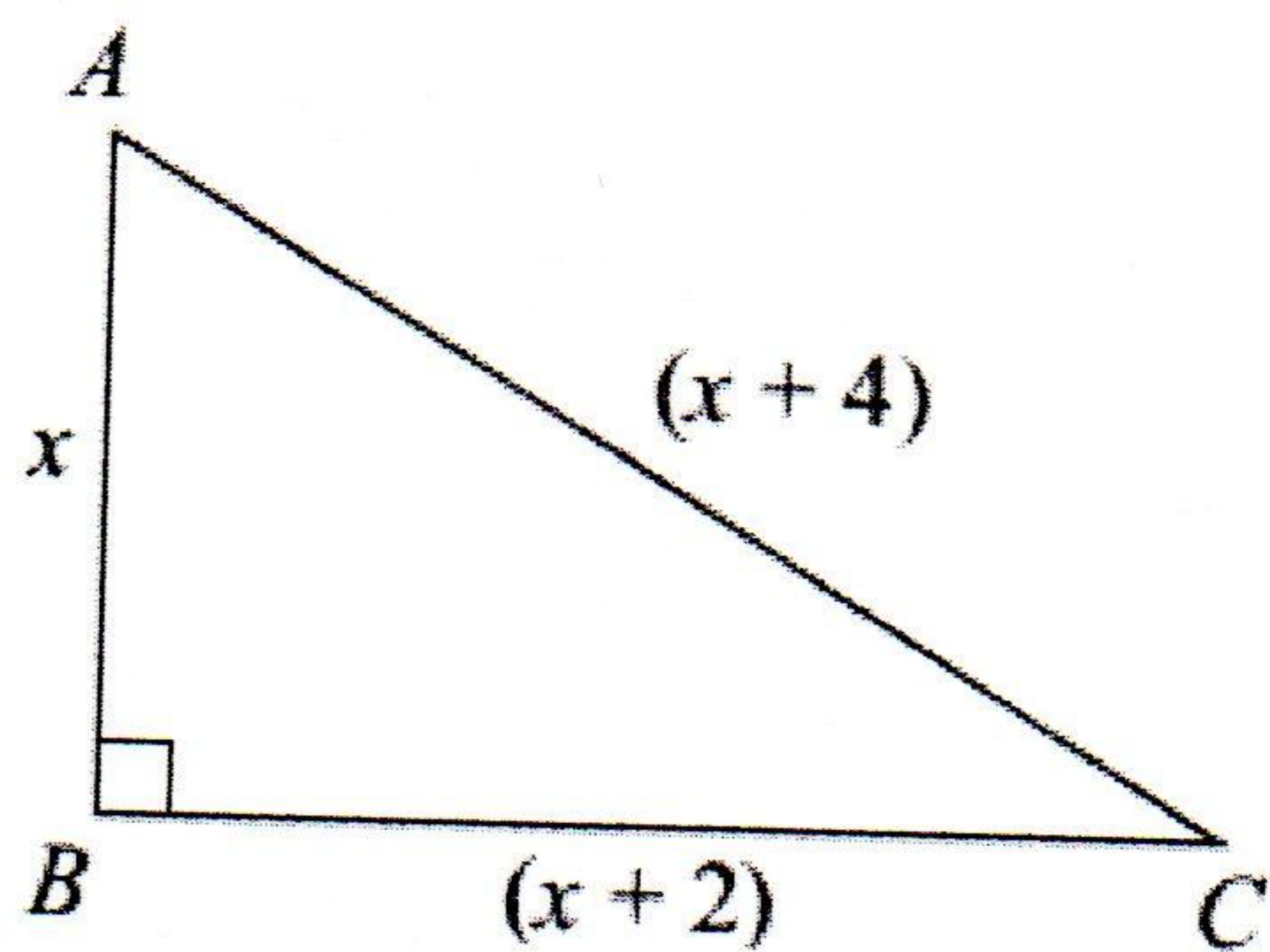
(ii) Hence work out the length of the longest side of the shape.
 $\dots\dots\dots \text{ cm}$

Q6. ABC is a right-angled triangle.
All the measurements are in centimetres.

$$AB = x$$

$$BC = (x + 2)$$

$$AC = (x + 4)$$



Show that $x^2 - 4x - 12 = 0$

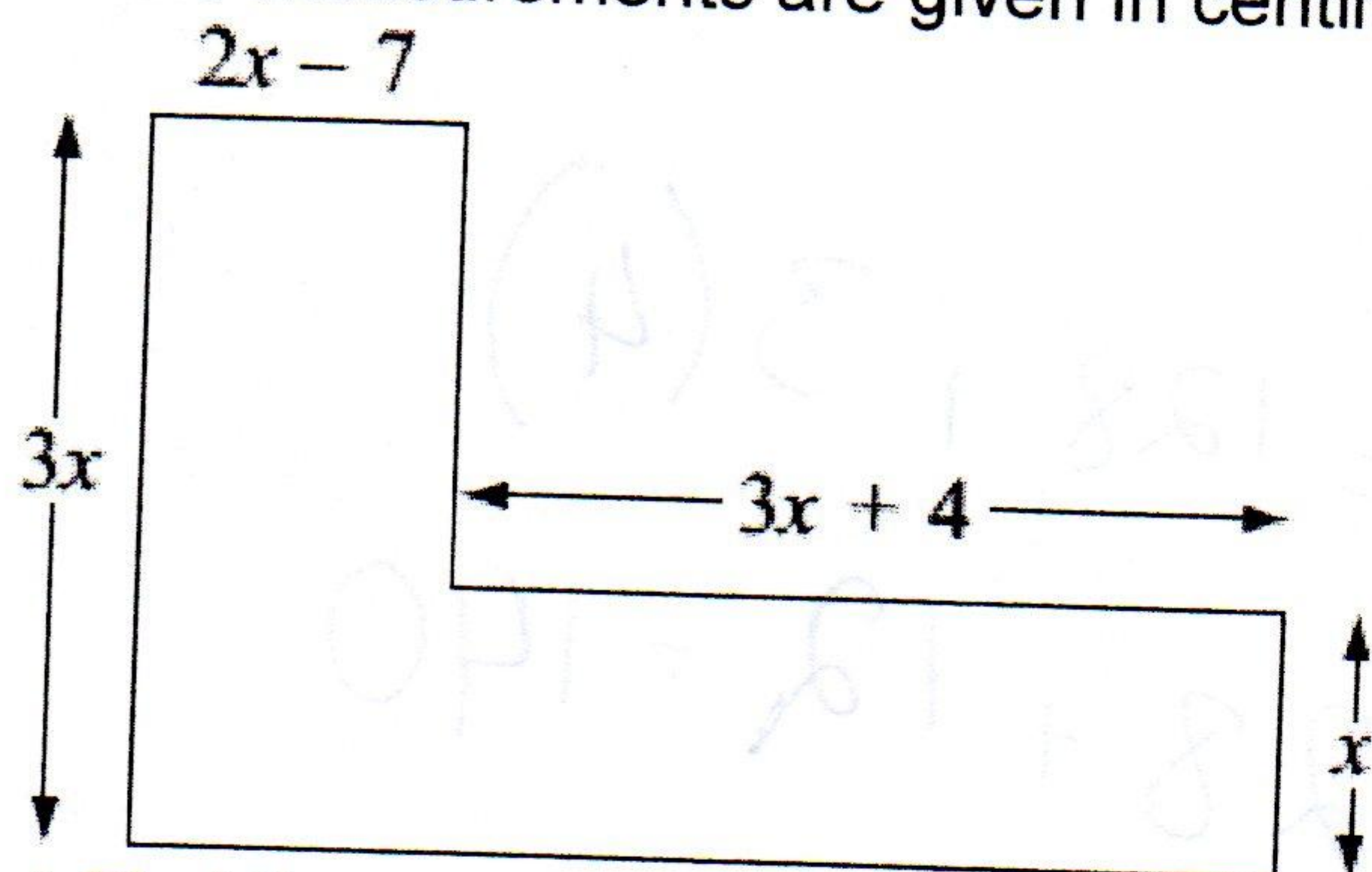
(b) (i) Solve $x^2 - 4x - 12 = 0$

$\dots\dots\dots$

(ii) Hence, write down the length of AC .

$AC = \dots\dots\dots \text{ cm}$

Q7. The diagram shows a 6-sided shape. All the corners are right angles. All the measurements are given in centimetres.



- Find the area of the shape in algebraic expression and simplify into simplest form.
- The area of the shape is 85 cm^2 . Make equation and solve the equation. Give your solutions correct to 3 significant figures.
 $x = \dots\dots\dots$ or $x = \dots\dots\dots$

Q8. ABC is an isosceles triangle.

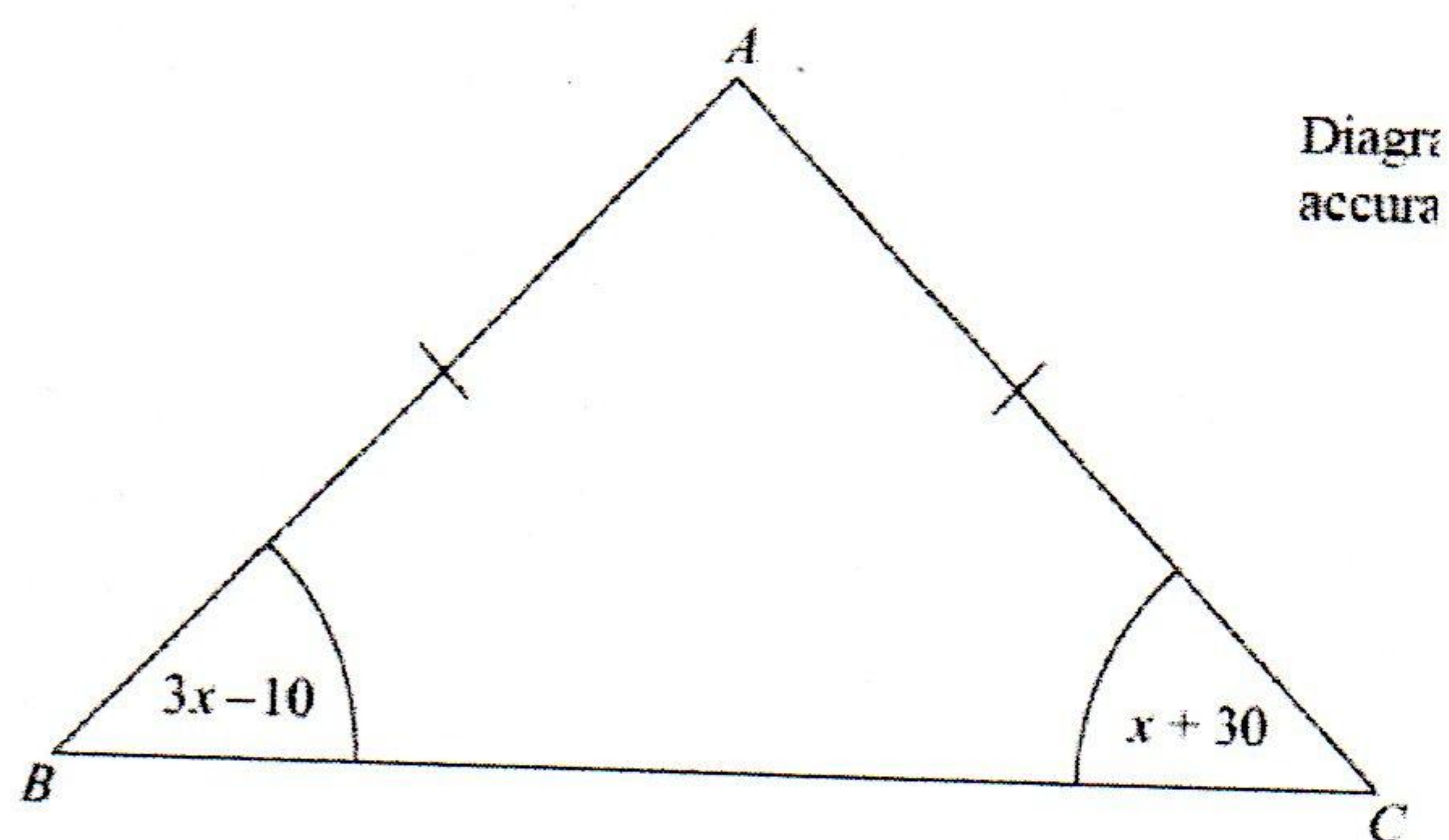


Diagram
accurate

$AB = AC$.

- Explain why $3x - 10 = x + 30$

- Solve $3x - 10 = x + 30$

$x = \dots\dots\dots$