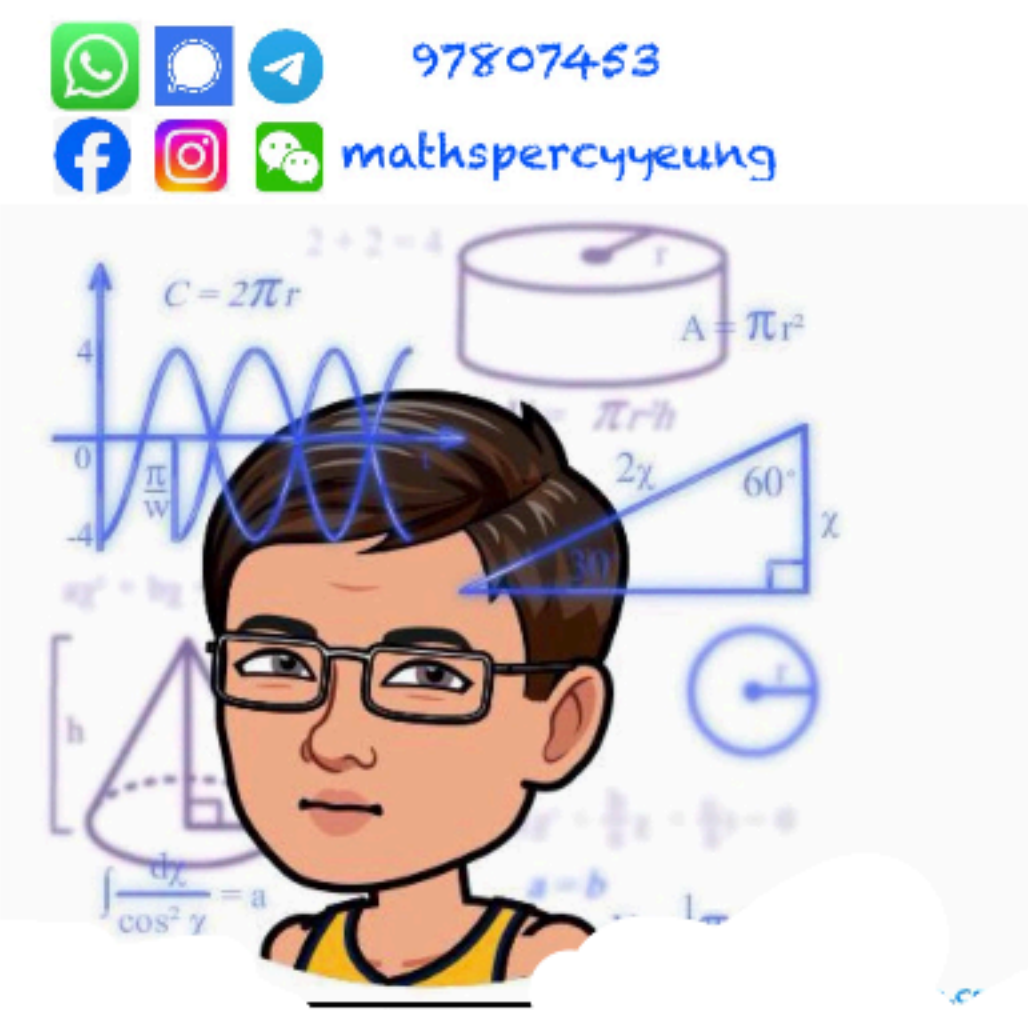




FINAL EXAMINATION
2023 – 2024
QUESTION-ANSWER BOOK

Subject: **Secondary 2 Mathematics**
Paper: **II**
Time Allowed: **1 hour**
Total Marks: **100**

INSTRUCTIONS

- (1) Write your name, class and examination number in the spaces provided.
- (2) This paper consists of Three Sections, A(1), A(2) and B.
- (3) Attempt ALL questions in ALL Sections. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins.
- (4) Unless otherwise specified, the use of HKEAA approved electronic calculators is allowed.
- (5) Unless otherwise specified, all working must be clearly shown.
- (6) Unless otherwise specified, numerical answers should be exact or correct to 3 significant figures.

Exam Number :				
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No. of pages: **12**

Page	Marks	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Total		

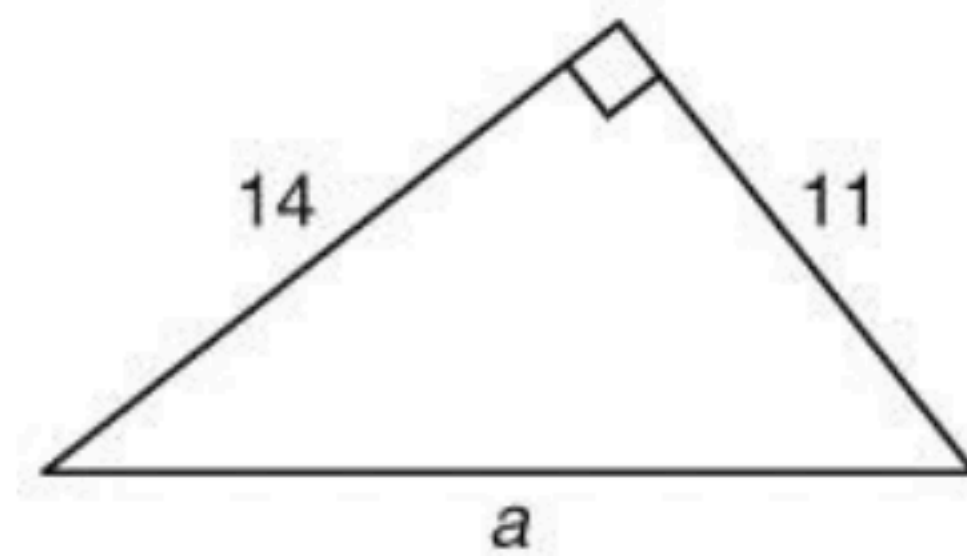
Section A1 (40 marks): Working steps must be shown in answering questions in this section.

1. The time taken to run 100 m by a student is measured to be 13.2 s, correct to the nearest 0.1 s. Find
- (a) the maximum absolute error, (1 mark)

- (b) the relative error, (2 marks)

- (c) the percentage error of this result. (2 marks)

2. Find the unknown in the figure. (3 marks)



3. Simplify $4\sqrt{50}$ in simplest form. (2 marks)

4. Rationalize the denominator of $\frac{20}{\sqrt{10}}$.

(2 marks)

5. Simplify the following expressions.

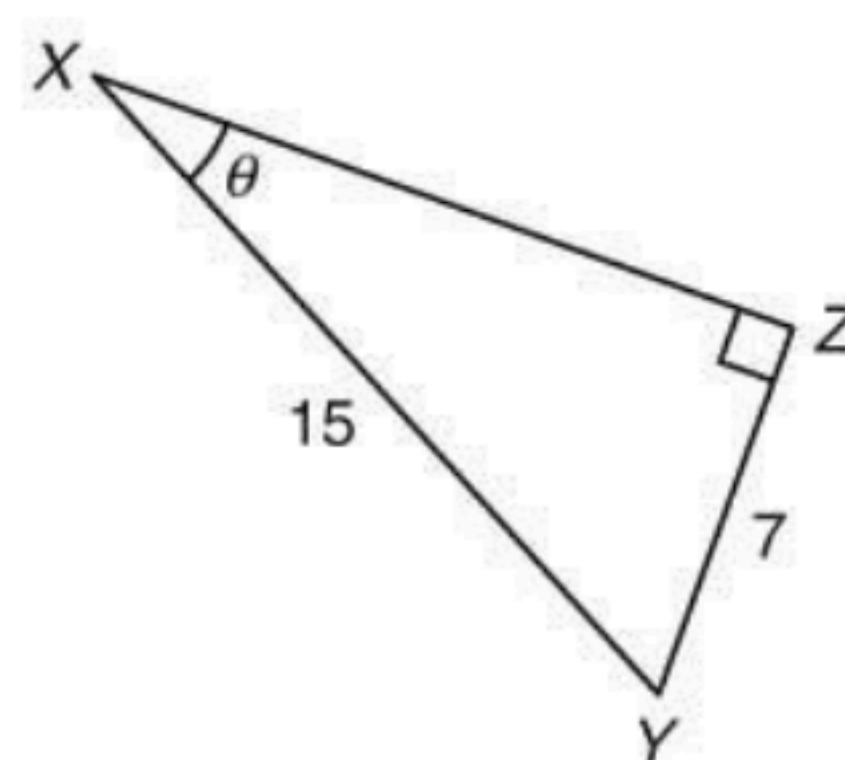
(4 marks)

(a) $3\sqrt{3} + \sqrt{12}$

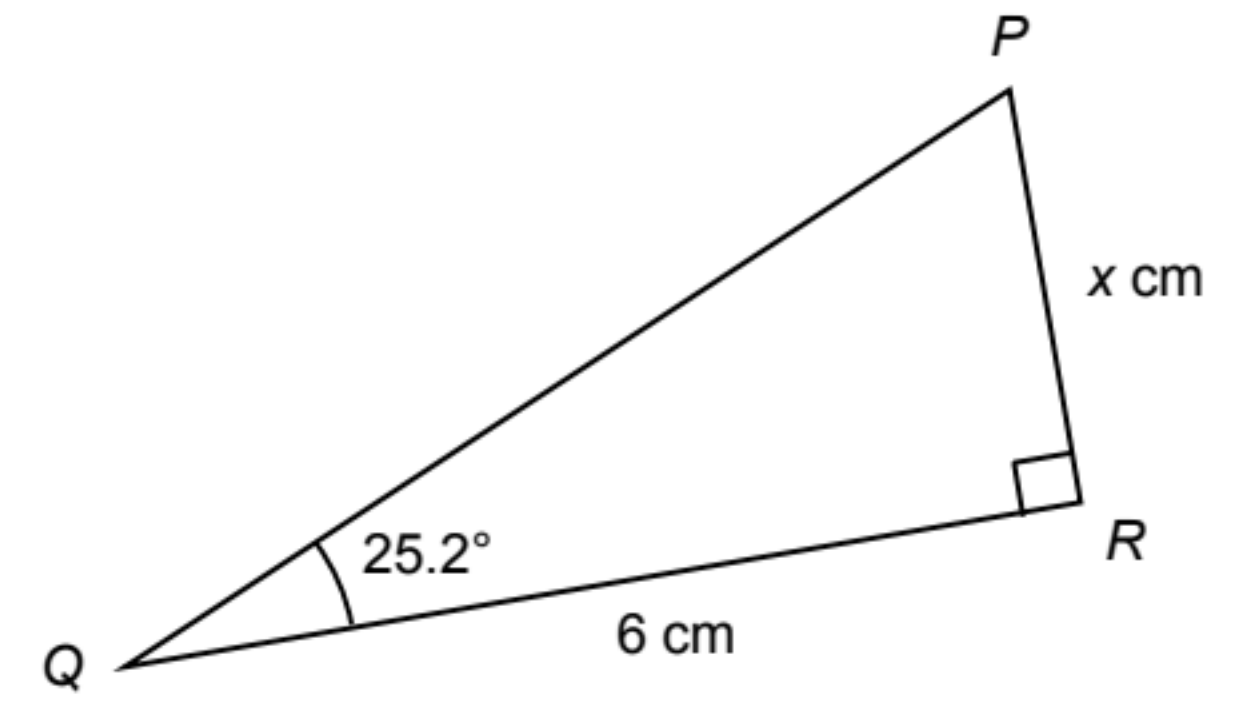
(b) $\sqrt{18} - 4\sqrt{2}$

6. In the figure, find θ correct to the nearest degree.

(2 marks)



7. In the figure, find the value of x correct to 3 significant figures. (2 marks)



8. If $\cos \theta = \frac{1}{6}$, find θ correct to the nearest 0.1° . (2 marks)

9. Find the values of the following expressions correct to 3 significant figures. (3 marks)

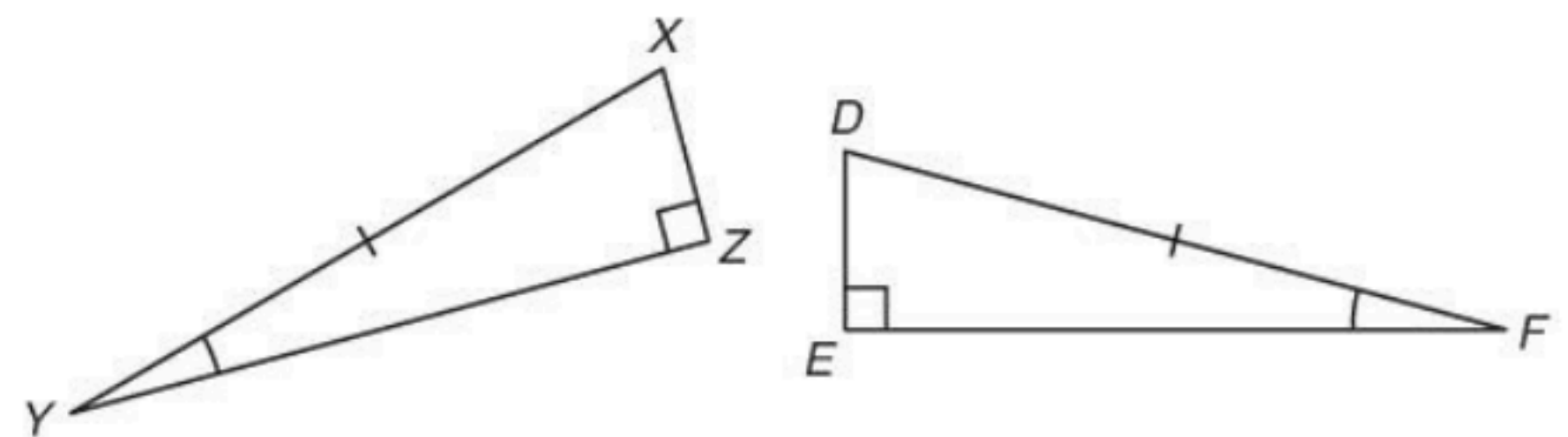
(a) $8 \sin 72^\circ$

(b) $\frac{2}{\cos 36^\circ}$

(c) $\frac{5}{3 \tan 72^\circ}$

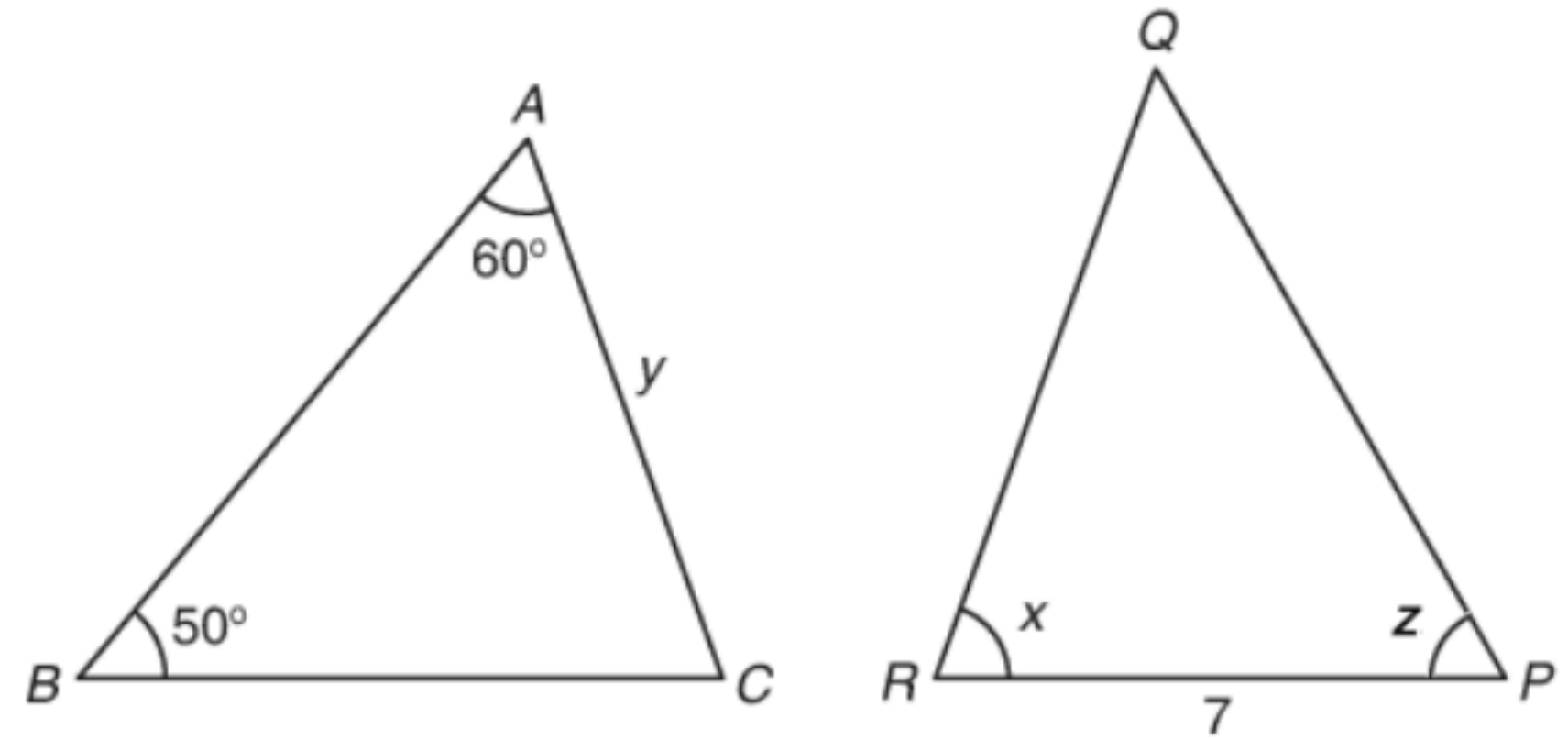
10. In the following, name a pair of congruent triangles and give the reason. (2 marks)

$\triangle XYZ \cong \triangle \underline{\hspace{2cm}} \quad (\underline{\hspace{2cm}})$



11. In the figure, $\triangle ABC \cong \triangle PQR$. Find the values of x , y and z .

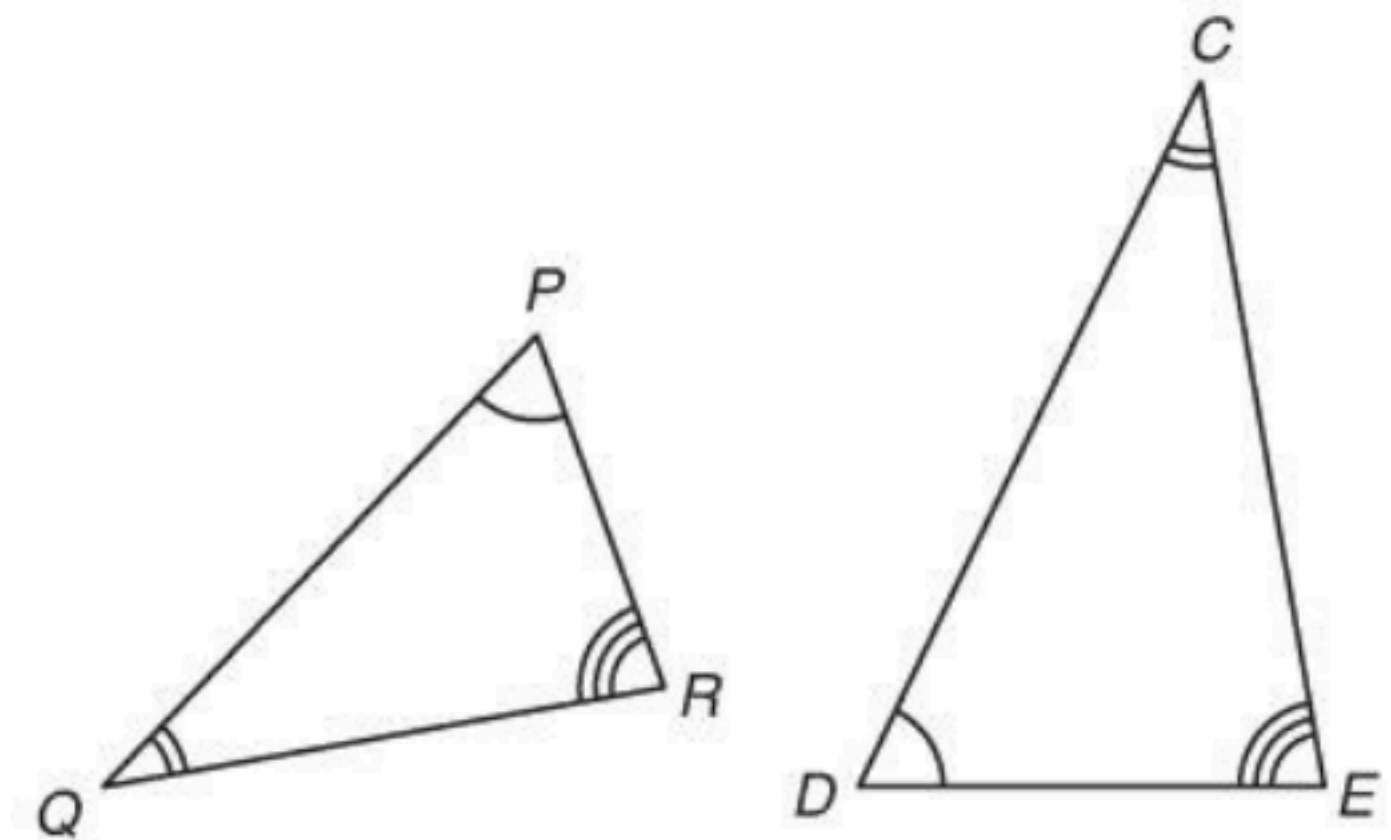
(4 marks)



12. In the figure, name a pair of similar triangles and give the reason.

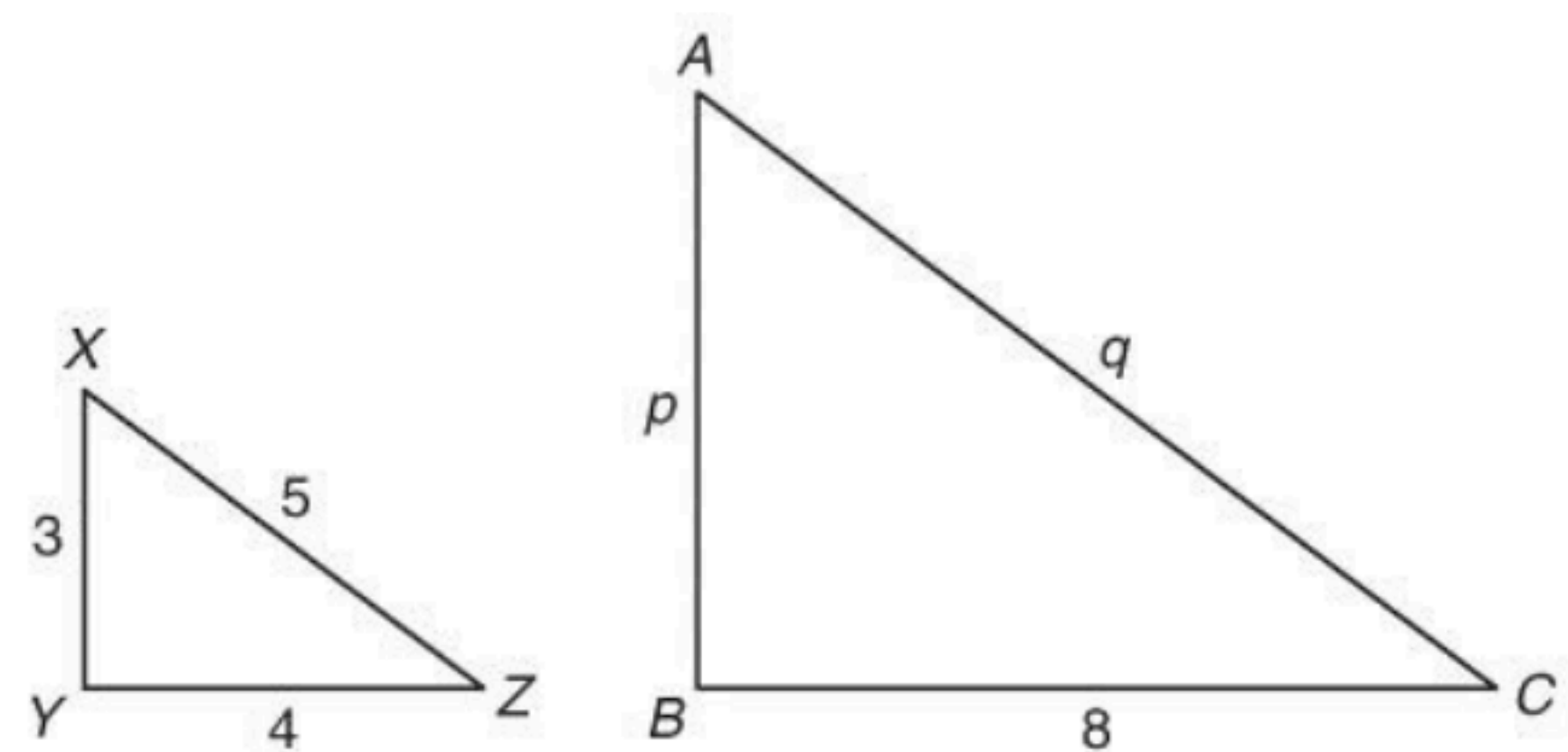
(2 marks)

$\triangle PQR \sim \triangle$ _____ ()

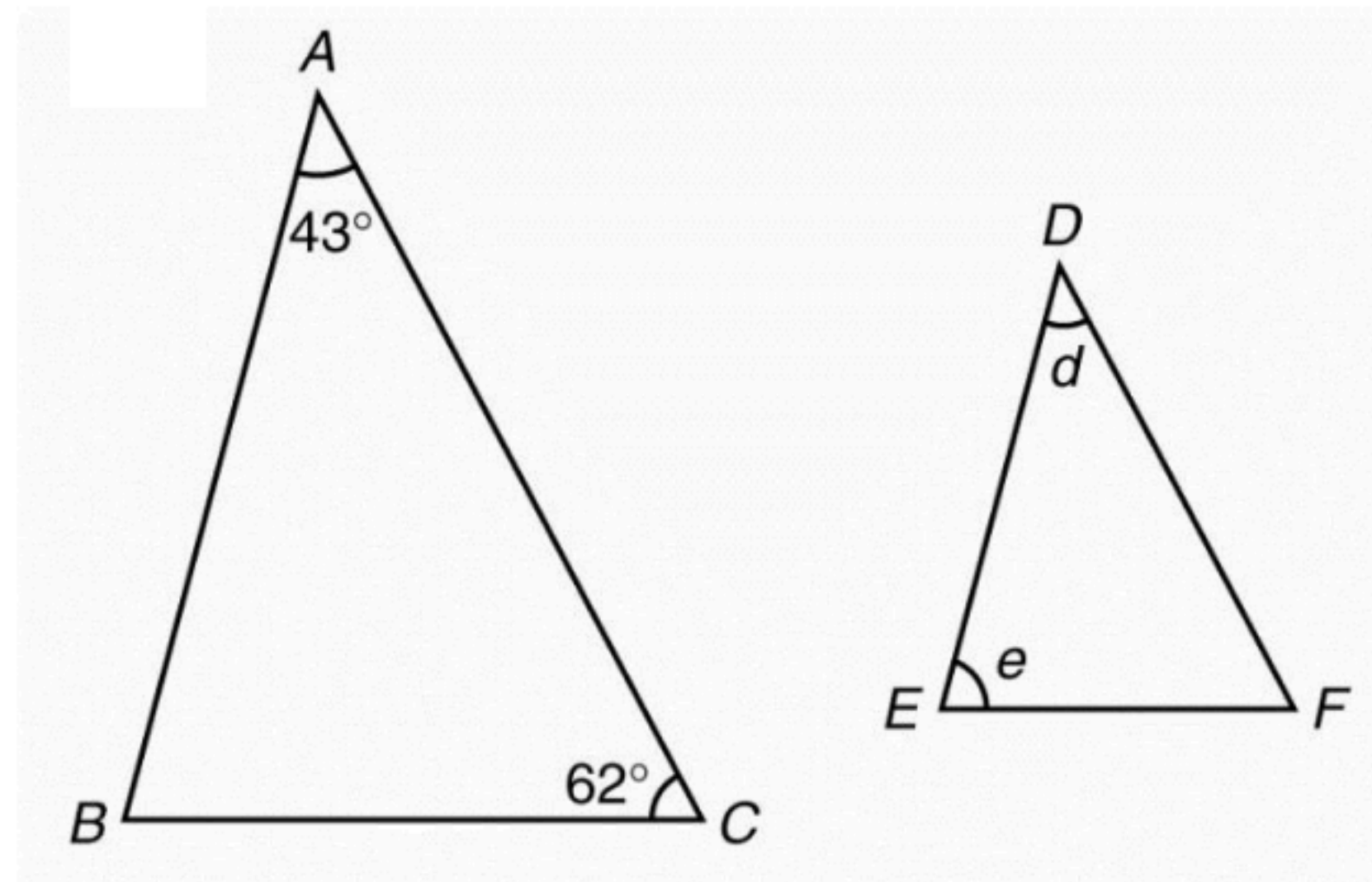


13. In the figure, $\triangle XYZ \sim \triangle ABC$. Find the values of p and q .

(3 marks)



14. In the figure, $\triangle ABC \sim \triangle DEF$. Find the unknowns d and e . (4 marks)



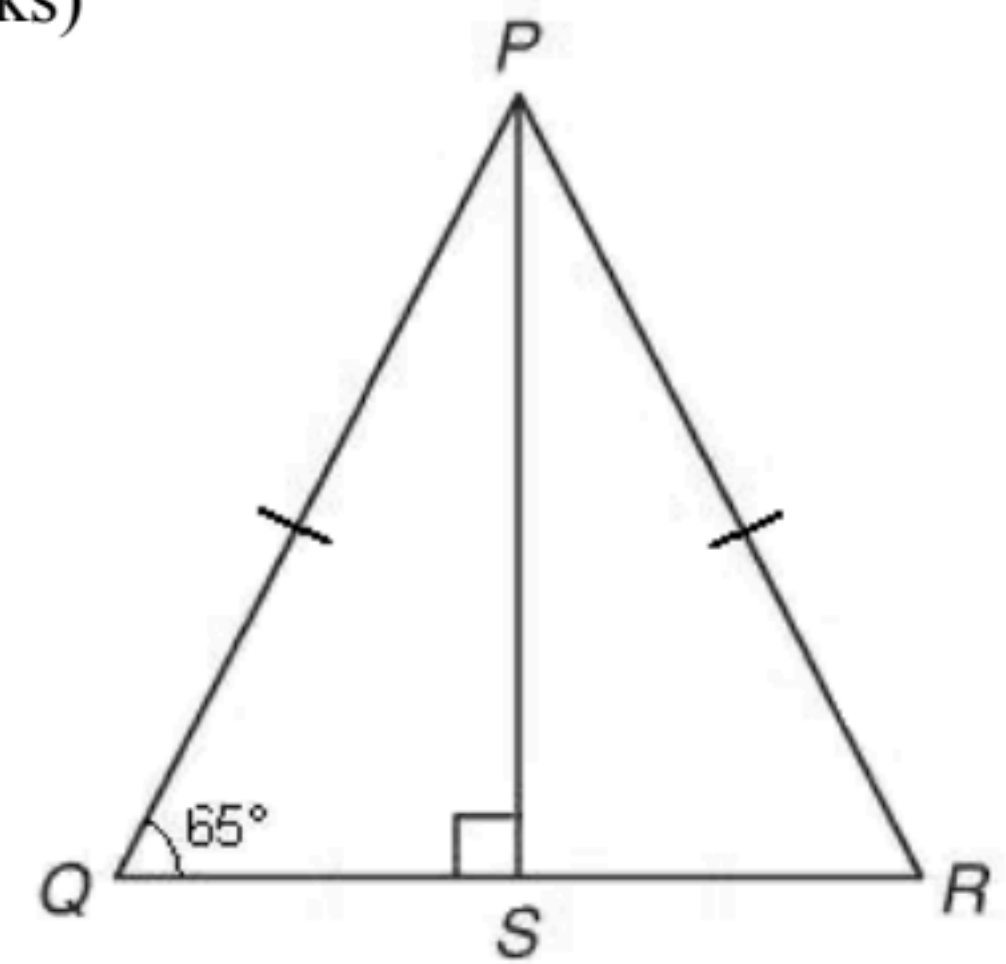
Section A2 (30 marks): Working steps must be shown in answering questions in this section.

1. The time taken to run 100 m by a student is measured to be 14.5 s, correct to the nearest 0.1 s.
- (a) What is the maximum absolute error? (2 marks)
- (b) What limits does the actual time taken lie between? (3 marks)

2. In the figure, QSR is a straight line and $PQ = PR$.

(a) Prove that $\triangle PSQ \cong \triangle PSR$.

(4 marks)

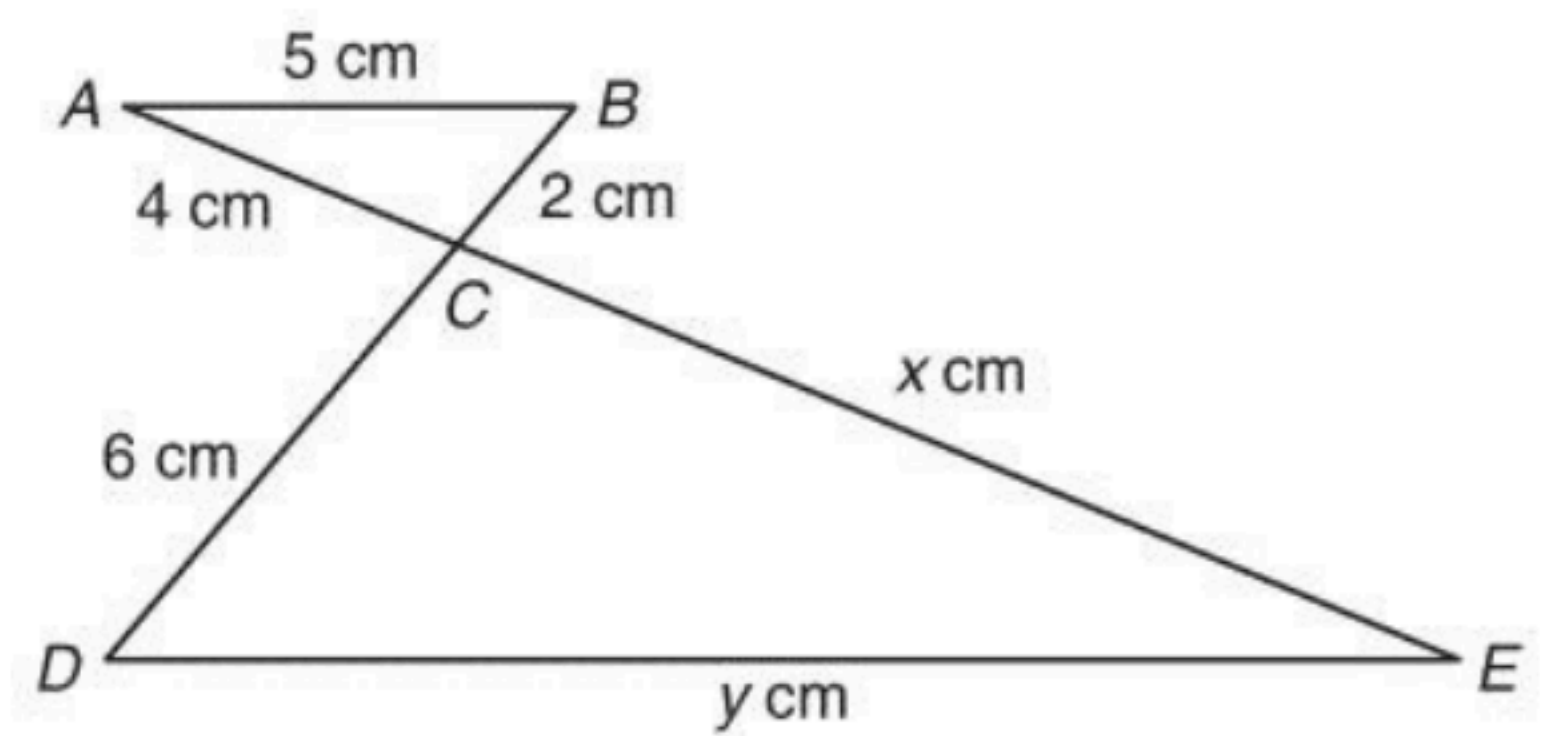


(b) Find $\angle RPS$.

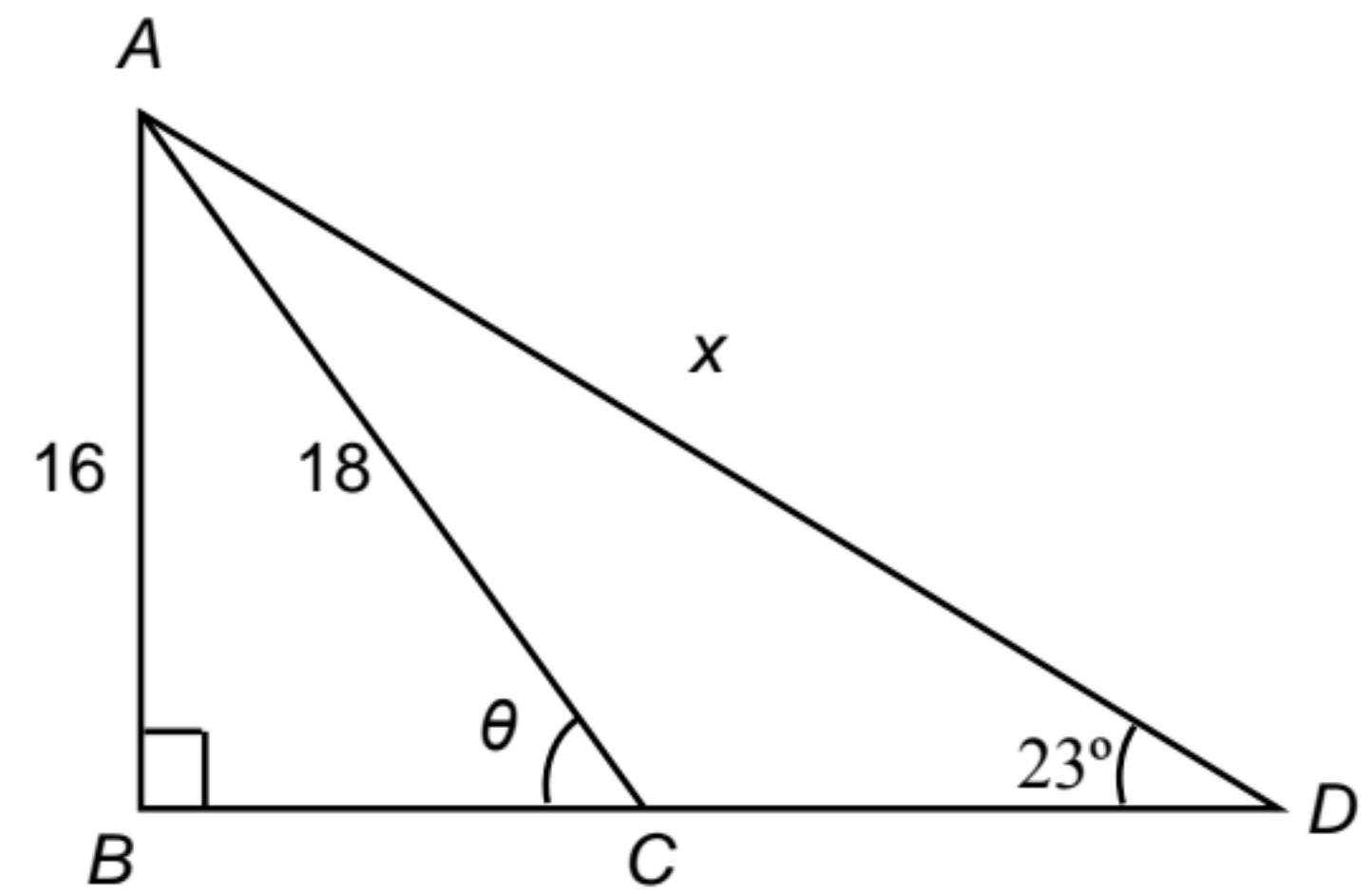
(3 marks)

3. In the figure, $\triangle ACB \sim \triangle ECD$. Given that $AB = 5$ cm, $AC = 4$ cm, $CB = 2$ cm and $CD = 6$ cm, find the unknowns x and y .

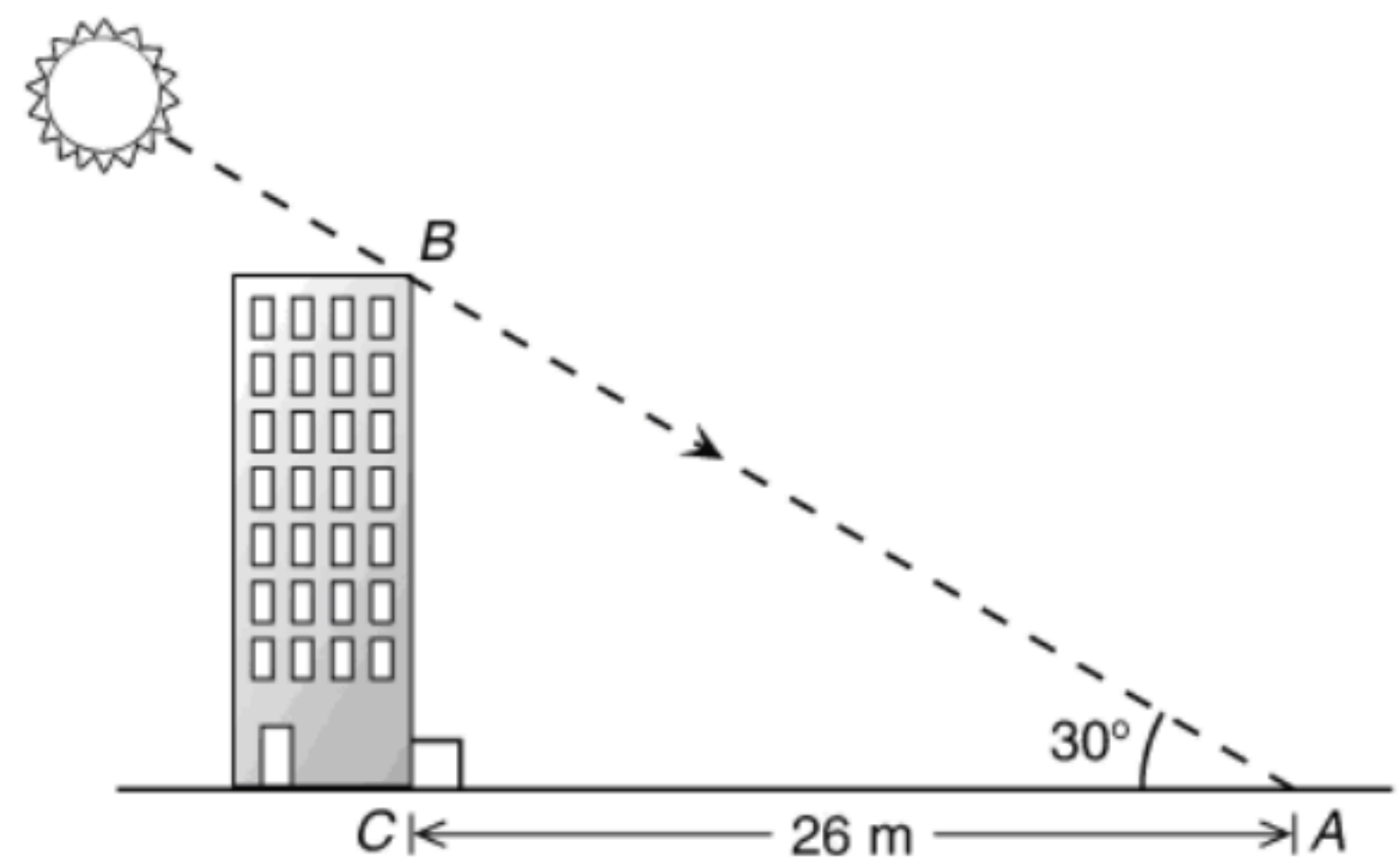
(4 marks)



4. In the figure, BCD is a straight line. Find x and θ . (4 marks)

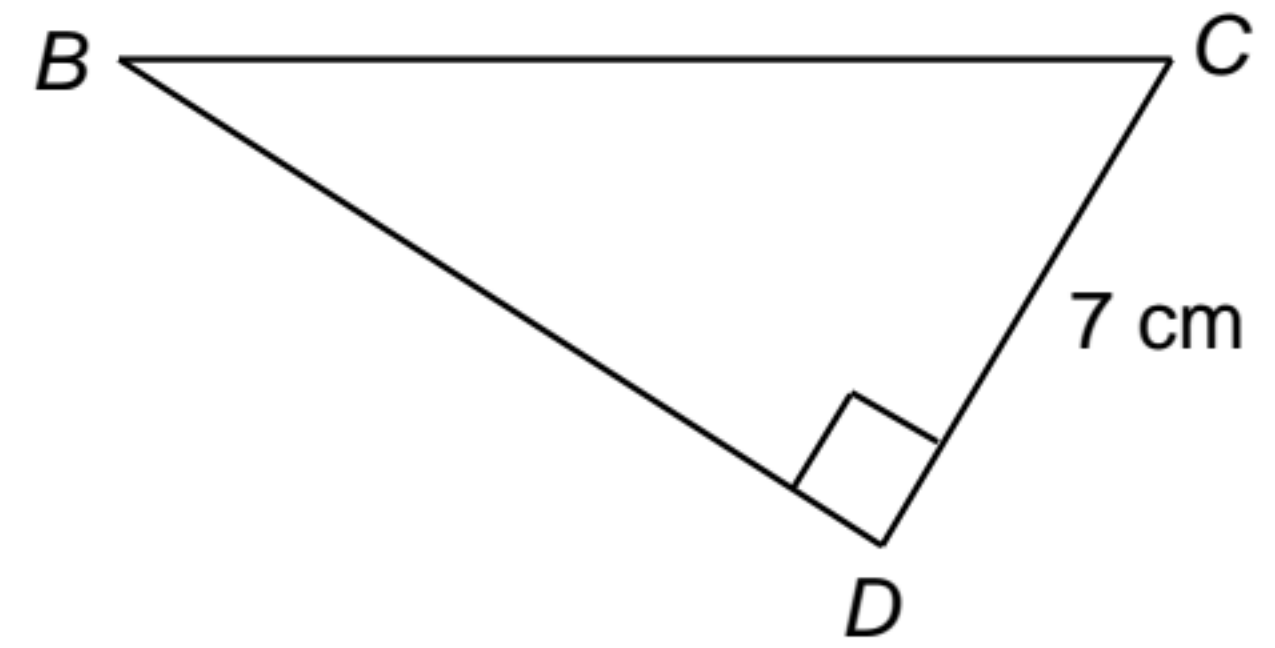


5. A building casts a shadow 26 m long on the ground when the sun ray makes an angle of 30° with the horizontal ground.
 (a) Find the height of the building. (2 marks)



- (b) Two hours later, the angle that the sun ray makes with the ground becomes 15° . Find the length of the new shadow. (3 marks)

6. The figure shows $\triangle BCD$ of area 70 cm^2 . $CD = 7 \text{ cm}$ and $\angle D = 90^\circ$.
(a) Find the length of BD . (2 marks)



- (b) Find the perimeter of $\triangle BCD$. (3 marks)

Section B (30 marks): Working steps must be shown in answering questions in this section.

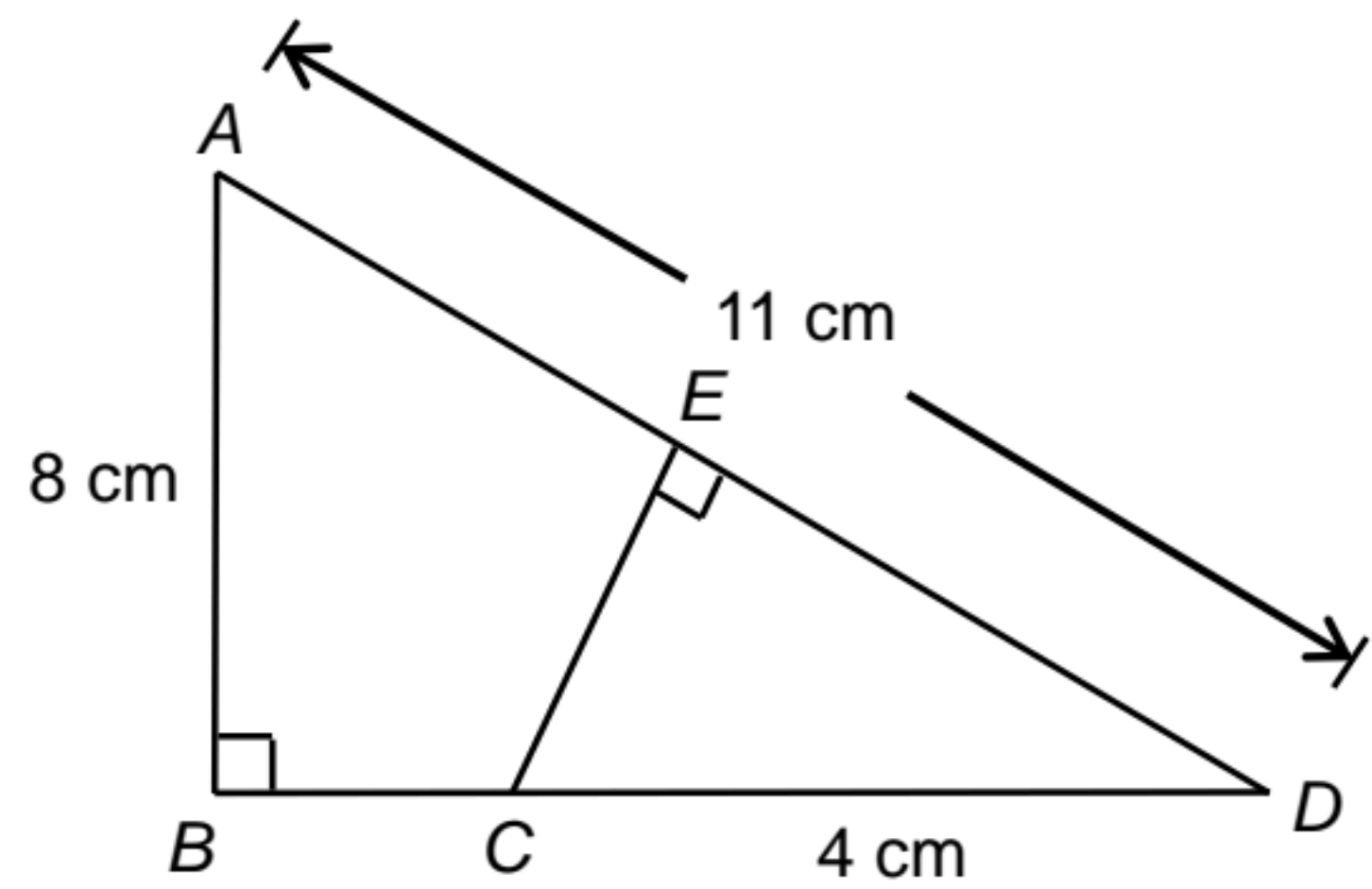
1. Simplify the following expressions. (6 marks)

(a) $\sqrt{112} + \sqrt{28} - \sqrt{63}$

(b) $(\sqrt{5} + 1)(\sqrt{5} - 1)$

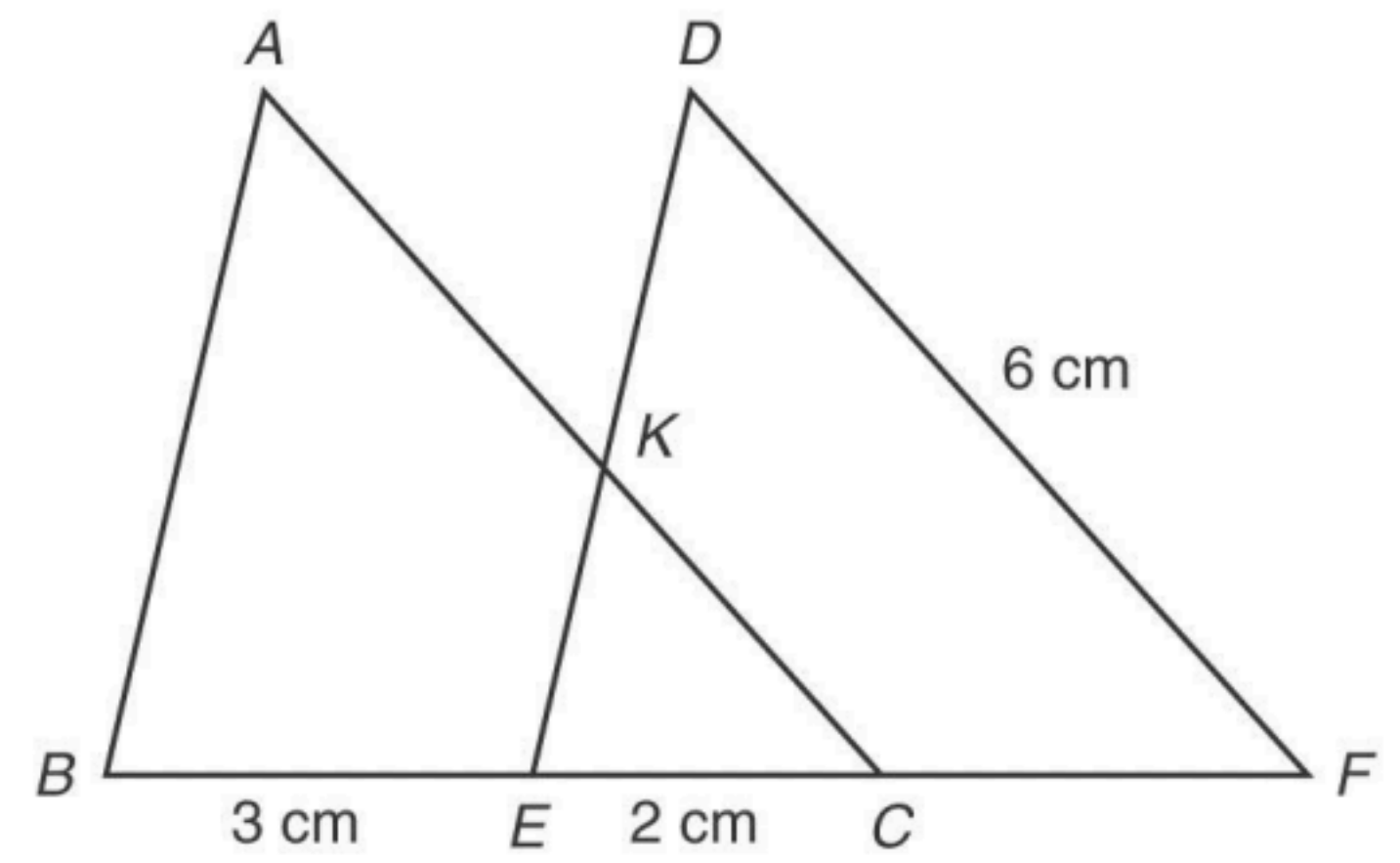
2. In the figure, AED is a straight line.

- (a) Find $\angle A$. (2 marks)



- (b) Find the length of AE . (4 marks)

3. In the figure, $BECF$ is a straight line, $\triangle ABC \cong \triangle DEF$, $BE = 3\text{ cm}$, $EC = 2\text{ cm}$ and $DF = 6\text{ cm}$.
(a) Find CF . (3 marks)



- (b) Are $\triangle KEC$ and $\triangle DEF$ similar? Give the reason. (3 marks)

- (c) Find AK . (4 marks)

4. The length, width and height of a metal cuboid is 24.4 cm, 15.8 cm and 5.0 cm respectively. All the measurements are correct to the nearest 0.1 cm.

- (a) (i) Find the range of the actual volume of the metal cuboid. (4 marks)
(Give your answers correct to the nearest cm^3 .)

- (ii) Is it possible that the actual volume of the metal cuboid is more than 2 L? Explain your answer. (2 marks)

- (b) The price of the metal cuboid is \$9638. For the lower limit of the actual volume of the metal cuboid, find the price rate of the metal cuboid in $\$/\text{cm}^3$. (Give your answer correct to 3 significant figures.) (2 marks)

END OF PAPER