Congruence and similarity test

http://topdrawer.aamt.edu.au/Geometric-reasoning/Assessment/Assessment-approaches/Pen-and-paper/Congruence-and-similarity-test

Level of achievement: Elementary Satisfactory High Excellent

Time allowed: 30 minutes

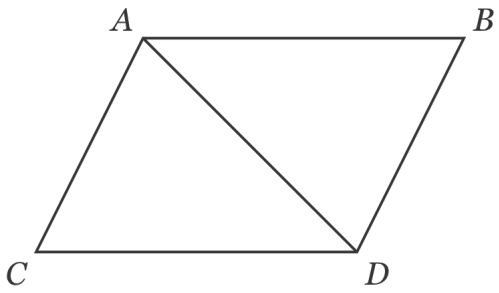
Answer all questions. Show all necessary working. Calculators may be used.

1. "These two shapes are congruent."
   Explain the meaning of the above statement.
   In your answer mention sides, angles and area.

2. "These two shapes are similar."
   Explain the meaning of the above statement.
   In your answer mention sides, angles and enlargement.

3. Gracie says: "It is possible that a pair of similar shapes could also be congruent."
   Explain why she is correct, making mention of the phrase "enlargement factor".

4. This shape is a parallelogram.



   (a) Name one pair of matching sides in triangle *ABC* and triangle *ACD*
   How do you know they are equal?

   (b) Name one pair of matching angles in triangle *ABC* and triangle *ACD*.
   How do you know they are equal?

   (c) Write down an additional pair of matching sides or angles that would provide enough information to ensure that the triangles are congruent.

   (d) Which congruency test could be used to prove the triangles are congruent?

5. *ABCD* is a rectangle. *AC* and *BD* are the diagonals, which meet at *E*.

   (a) Draw a diagram.

   (b) Name a pair of congruent triangles.

   (c) How do you know they are congruent? Which congruency test did you apply?

6. *ABCD* is a square. *AC* and *BD* are the diagonals, which meet at *E*.

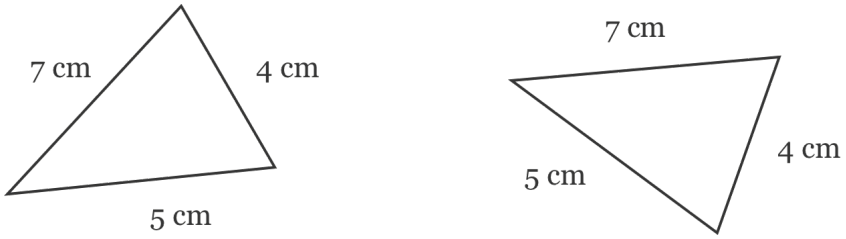
   (a) Draw a diagram

   (b) Name a pair of similar triangles (that are NOT congruent).

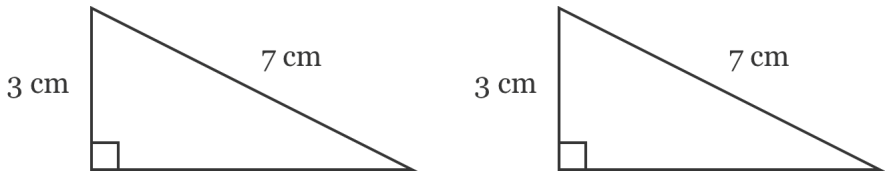
   (c) How do you know they are similar? Which similarity test did you apply?

7. Are these triangles congruent? If they are, state the congruency test:

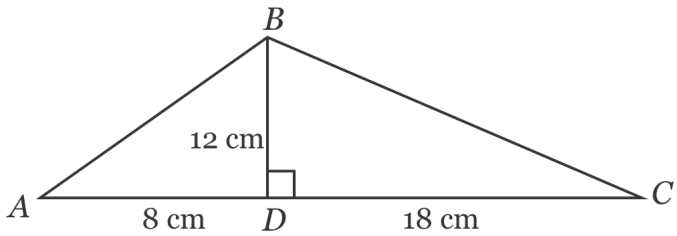
   (a)



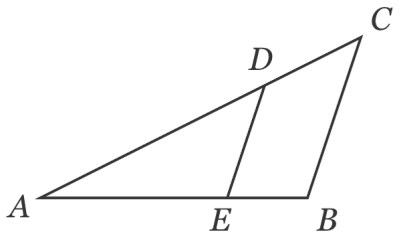
   (b)



8. Why is triangle *ABD* similar to triangle *BDC*?



9. In the diagram, *DE* is parallel to *CB*.



(a) Prove that triangle *ABC* and triangle *ADE* are similar.

(b) *DE* = 5 cm and *CB* = 8 cm. What is the enlargement factor?

(c) *AD* is 13 cm. How long is *AC*?

(d) *BE* is 6.6 cm. How long is *AE*?