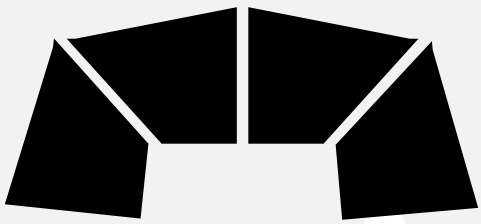
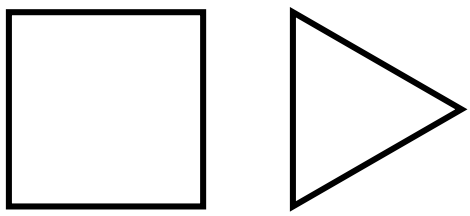
# 58. How to calculate missing angles inside shapes made of triangles and quadrilaterals

## Scenario Questions:

1. In a spaceship, there is a control panel with four identical screens shaped like quadrilaterals. If three angles in one screen measure 80 degrees, 90 degrees, and 110 degrees, what is the measure of the missing angle?



2. Emma is organising a treasure hunt, if you find an angle in a quadrilateral that combines with an angle in a triangle to equal 150° you win a prize. Saddiq finds an equilateral triangle and a square? Has he won a prize?



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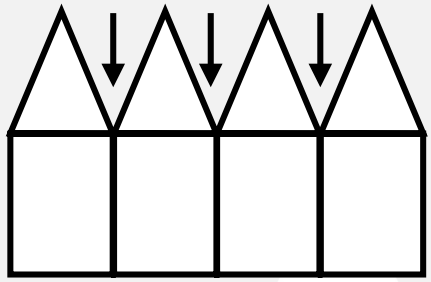
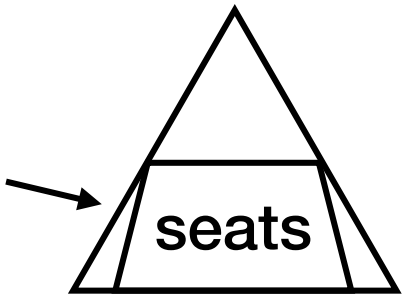
## Scenario Questions:

3. At a playground, there is a climbing structure made to look like a row of houses. Each house has a roof made of an isosceles triangle, where the top angle is 40° and the other two angles are equal. If the triangles sit on rectangles. What is the angle of the gap where the roofs meet?



4. John is building a stadium in the shape of an equilateral triangle. It has a trapezium-shaped seating section where the angles are 100°, 100°, 80° and 80°. John needs to work out the angle made between the seating area and the side wall. What is it?



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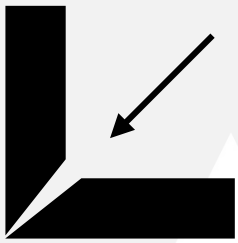
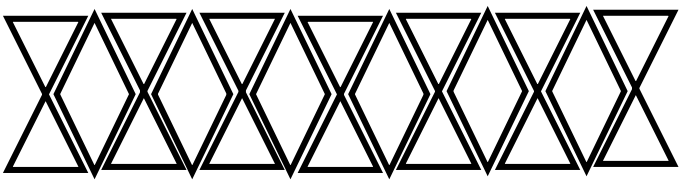
## Scenario Questions:

5. Janet is making a join for a shelf. She accidentally cut the join incorrectly. She wants to measure how far out she is. She knows that three of the angles for each piece of wood are 90°, 90° and 138°. How far off making a right angle is she?



6. Lisa wants to construct a mosaic artwork using triangular and quadrilateral-shaped tiles. She wants to use equilateral triangles. What size does she need to make the angles of the quadrilateral?



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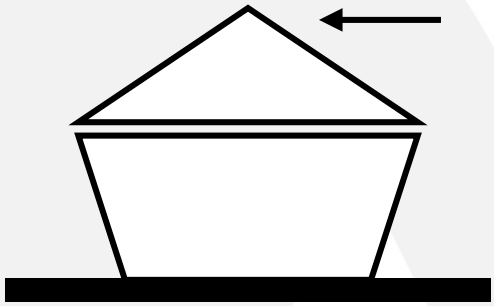
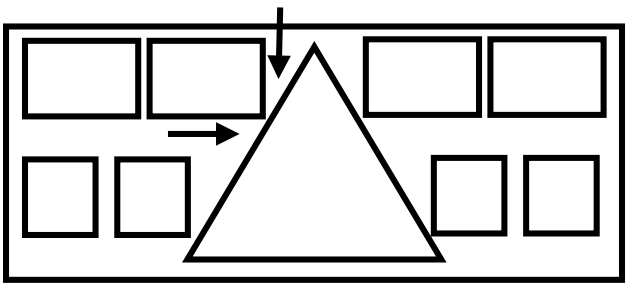
## Scenario Questions:

7. At a museum, there is a symmetrical sculpture made of a triangle onto of a trapezium. The total angle where the triangle meets the trapezium is 110°. The sculpture makes a 70° angle with the floor. How big is the top angle of the triangle?



8. In a classroom, there is a display board with an equilateral triangle and rectangular artwork. If all the bases of the shape are parallel, what angles does the rectangle make when it touches the triangle?



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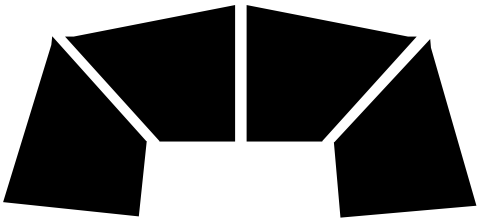
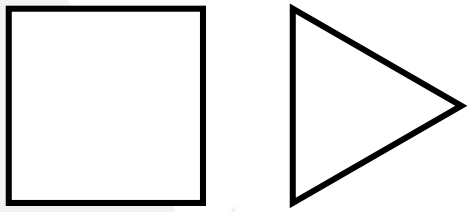
## Scenario Questions: Answers

1. In a spaceship, there is a control panel with four identical screens shaped like quadrilaterals. If three angles in one screen measure 80 degrees, 90 degrees, and 110 degrees, what is the measure of the missing angle?



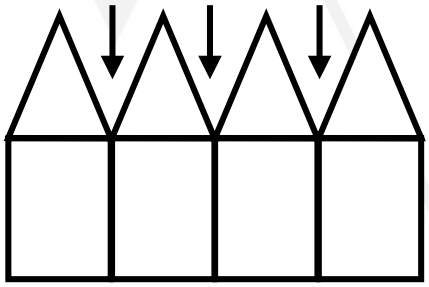
**1. Missing angle = 360° - 80° - 90° - 120° = 80°.**

2. Emma is organising a treasure hunt, if you find an angle in a quadrilateral that matches with an angle in a triangle to equal 150° you win a prize. Saddiq finds an equilateral triangle and a square? Has he won a prize?



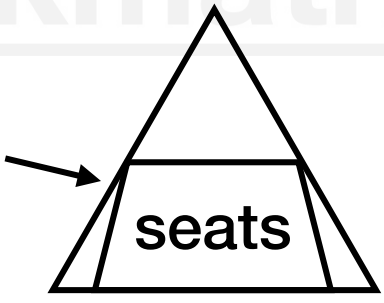
**2. Yes: 60° + 90° = 150°**

3. At a playground, there is a climbing structure made to look like a row of houses. Each house has a roof made of an isosceles triangle, where the top angle is 40° and the other two angles are equal. If the triangles sit on rectangles. What is the angle of the gap where the roofs meet?



**3. Missing angle = 360° - 90° - 90° - 70° - 70°= 40°.**

4. John is building a stadium in the shape of an equilateral triangle. It has a trapezium-shaped seating section where the angles are 100°, 100°, 80° and 80°. John needs to work out the angle made between the seating area and the side wall. What is it?




**4. Missing angle = 180° - 60° - 100° = 20°.**

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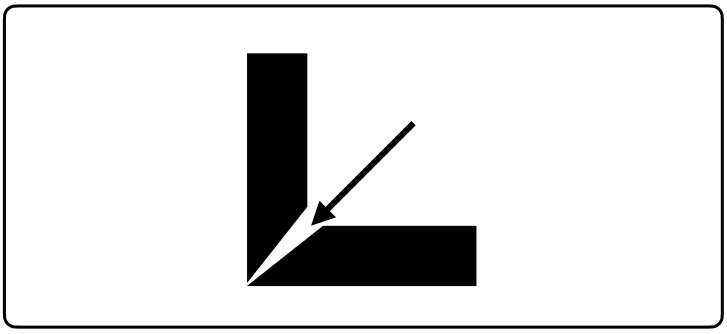
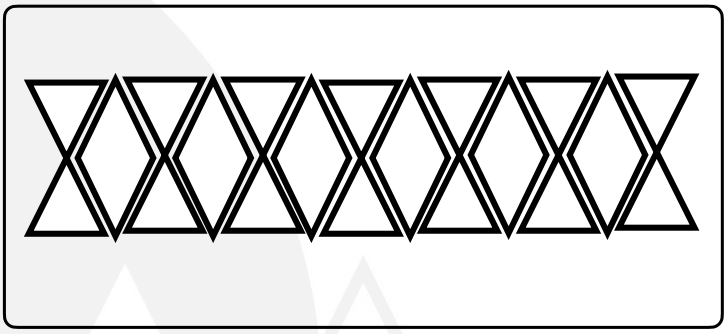
## Scenario Questions: Answers

5. Janet is making a join for a shelf. She accidentally cut the join incorrectly. She wants to measure how far out she is. She knows that three of the angles for each piece of wood are 90°, 90° and 138°. How far off making a right angle is she?



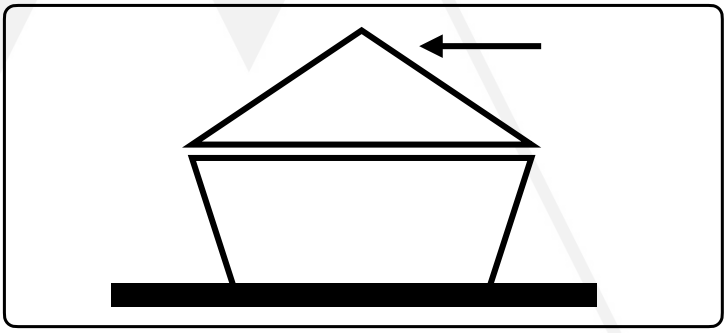
**5. Missing angle = 360° - 90° - 90° - 138° = 42°: Off a right angle = 90° - 42° - 42° = 6°**

6. Lisa wants to construct a mosaic artwork using triangular and quadrilateral-shaped tiles. She wants to use equilateral triangles. What size does she need to make the angles of the quadrilateral?



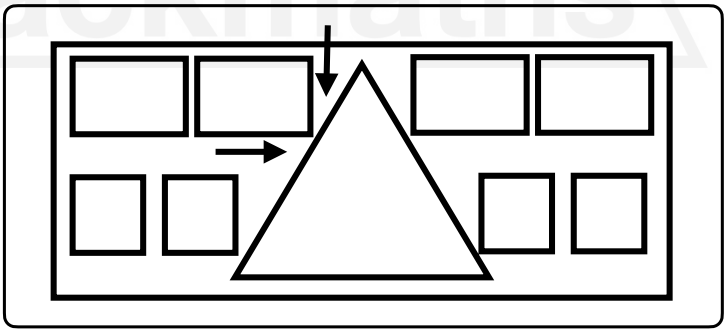
**6. Top angle = 180° - 60° - 60° = 60°: Side angle = (360° - 60° - 60°) ÷ 2 = 120°**

7. At a museum, there is a symmetrical sculpture made of a triangle onto of a trapezium. The total angle where the triangle meets the trapezium is 110°. The sculpture makes a 70° angle with the floor. How big is the top angle of the triangle?



**7. Bottom trapezium = 110°. Top Trapezium = 70°.**
**Equal angles in triangle = 110° - 70° = 40°: Top angle in Triangle = 180° - 40° - 40° = 100°**

8. In a classroom, there is a display board with an equilateral triangle and rectangular artwork. If all the bases of the shape are parallel, what angles does the rectangle make when it touches the triangle?



**8.Side of top triangle: (180° - 60°) ÷ 2 = 60°**
**Top angle between rectangle and triangle = 180° - 60° - 90° = 30°**
**Bottom angle between rectangle and triangle = 180° - 30° - 90° = 60°**