Year 8 Angles and Constructions – Challenge

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Answers and worked solutions · 8 questions

A. Think like a mathematician

1. **Yes. A rhombus has four equal sides, and a square has four equal sides (with right angles too).**
   Think about the properties
   A rhombus has four equal sides, and a square has four equal sides (with right angles too).
   Decide

2. **No. A rhombus need not have right angles, e.g. one with angles 60° and 120°.**
   Think about the properties
   A rhombus need not have right angles, e.g. one with angles 60° and 120°.
   Decide

3. **No. Only an isosceles trapezium does; a trapezium with one right angle has none.**
   Think about the properties
   Only an isosceles trapezium does; a trapezium with one right angle has none.
   Decide

4. **56° is the third interior angle. The exterior angle is 180 − 56 = 124°, the sum of the interior opposite angles.**
   Error: that is the interior angle, not the exterior one
   Exterior = 180 − 56
   = 124° = 53 + 71

5. **The exterior angle equals the sum of both interior opposite angles: 74 + 48 = 122°.**
   Error: only one of the opposite angles was used
   Exterior angle = A + C
   = 122°

6. **x + b = 180° (angles on a straight line) and a + b + c = 180° (angles in a triangle). So x = 180 − b = a + c.**
   Angles on a straight line: x + b = 180
   Angles in a triangle: a + b + c = 180
   So x = a + c

7. **x = 13 (alternate angles are equal)**
   Alternate angles are equal: 4x + 53 = 105
   4x = 52
   x = 13

8. **x = 21°; the angles are 21° and 42°**
   Exterior angle = sum of interior opposite angles: x + 2x = 63
   3x = 63, x = 21
   The angles are 21° and 42°