Angles and triangles

Free Extra Maths Class · Grade 7

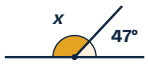
Name: _____

Remember: Straight line = 180°; around a point = 360°; vertically opposite angles are equal; angles of a triangle = 180°.
Why? A straight line is a half turn. Tear off the three corners of a triangle: together they make exactly a straight line.

1. What kind of angle is it? (a) 64°; (b) 180°; (c) 151°; (d) 245°

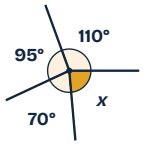
2. A triangle has sides of 6 cm, 6 cm and 4 cm. What kind of triangle is it according to its sides?

3. Calculate *x*. Give a reason.

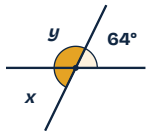


4. A triangle has angles of 35°, 90° and 55°. What kind of triangle is it according to its angles?

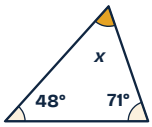
5. Calculate *x*. Give a reason.



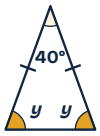
6. Calculate *x* and *y*. Give reasons.



7. Calculate *x*. Give a reason.



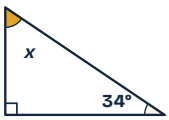
8. The triangle is isosceles. Calculate *y*. Give a reason.



9. Three angles lie together on a straight line: 75°, *x* and 38°. Calculate *x*. Give a reason.

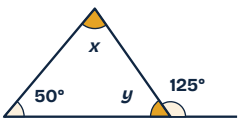
10. Can a triangle have angles of 95°, 50° and 45°? Give a reason.

11. Calculate *x*. Give a reason.

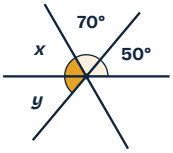


12. Three angles lie around a point: 150°, *x* and *x*. The two angles *x* are equal. Calculate *x*. Give a reason.

13. Calculate *y* and then *x*. Give reasons.



14. Three straight lines cross at one point. Calculate *x* and *y*. Give reasons.



15. In triangle PQR, ∠P = 30°. ∠Q is twice as big as ∠P. Calculate ∠R and say what kind of triangle PQR is according to its angles.

I got _____ **out of 15** ☆ ☆ ☆

Memorandum
Angles and triangles

Other correct methods are also right.

1. **(a) acute angle; (b) straight angle; (c) obtuse angle; (d) reflex angle**
   acute < 90°; obtuse between 90° and 180°; straight = 180°; reflex between 180° and 360°

2. **isosceles triangle**
   Two sides are the same length (6 cm and 6 cm).

3. **$x = 133°$**
   $x = 180° - 47° = 133°$ (∠s on a straight line = 180°)

4. **right-angled triangle**
   One angle is 90° (a right angle).

5. **$x = 85°$**
   $x = 360° - (110° + 95° + 70°) = 360° - 275° = 85°$ (∠s around a point = 360°)

6. **$x = 64°$; $y = 116°$**
   $x = 64°$ (vertically opposite ∠s are equal); $y = 180° - 64° = 116°$ (∠s on a straight line = 180°)

7. **$x = 61°$**
   $x = 180° - 48° - 71° = 61°$ (∠s of a triangle = 180°)

8. **$y = 70°$**
   $180° - 40° = 140°$; $140° \div 2 = 70°$ (∠s of a triangle = 180°; isosceles triangle: base angles are equal)

9. **$x = 67°$**
   $x = 180° - 75° - 38° = 67°$ (∠s on a straight line = 180°)

10. **No**
    $95° + 50° + 45° = 190°$, but the angles of a triangle must add up to 180°.

11. **$x = 56°$**
    $x = 180° - 90° - 34° = 56°$ (∠s of a triangle = 180°)

12. **$x = 105°$**
    $360° - 150° = 210°$; $210° \div 2 = 105°$ (∠s around a point = 360°)

13. **$y = 55°$; $x = 75°$**
    $y = 180° - 125° = 55°$ (∠s on a straight line = 180°); $x = 180° - 50° - 55° = 75°$ (∠s of a triangle = 180°)

14. **$x = 60°$; $y = 50°$**
    $x = 180° - 50° - 70° = 60°$ (∠s on a straight line = 180°); $y = 50°$ (vertically opposite ∠s are equal)

15. **∠R = 90°; right-angled triangle**
    ∠Q = 2 × 30° = 60°; ∠R = 180° − 30° − 60° = 90° (∠s of a triangle = 180°); ∠R is a right angle.