

Triangle Angle Properties

Unit: Geometry and Triangles - Student Practice Worksheet

Overview: Kabir drew a triangle with angles 70° , 80° , and 40° , and Zara said one angle had to be wrong before she even measured. Kabir added them up himself: $70+80+40 = 190$. "Every triangle's angles add up to exactly 180," Zara said. "Yours don't. Redraw it."

Practice Questions (30 Total)

Section A - Easy

Q1. Triangle with two angles 60° and 70° . The third interior angle?



60° and 70° given

- ☐ A. 60°
- ☐ B. 50°
- ☐ C. 130°
- ☐ D. 40°

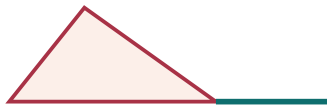
Q2. What do the three interior angles of any triangle sum to?

- ☐ A. 180°
- ☐ B. 90°
- ☐ C. 270°
- ☐ D. 360°

Q3. An exterior angle of a triangle equals the sum of which angles?

- ☐ A. All three interior angles
- ☐ B. Only the adjacent interior angle
- ☐ C. The two remote (non-adjacent) interior angles
- ☐ D. 180° minus itself

Q4. Remote interiors 40° and 50° . Exterior angle at the third vertex?

remote 40° and 50°

- ☐ A. 90°
- ☐ B. 10°
- ☐ C. 130°
- ☐ D. 180°

Q5. A triangle's exterior angle and its adjacent interior angle form what kind of pair?

- ☐ A. Vertically opposite pair
- ☐ B. Corresponding pair
- ☐ C. Co-interior pair
- ☐ D. Linear pair

Q6. A triangle has all three angles equal. What is each angle?

- ☐ A. 90°
- ☐ B. 60°
- ☐ C. 45°
- ☐ D. 120°

Q7. Exterior 120° on a straight line. Adjacent interior angle?

exterior 120°

- ☐ A. 60°
- ☐ B. 120°
- ☐ C. 180°
- ☐ D. 90°

Q8. Can a triangle have two angles that are both 100° ?

- ☐ A. Yes, always possible
- ☐ B. No, that already exceeds 180°
- ☐ C. Only for a right triangle
- ☐ D. Only for an equilateral triangle

Q9. A triangle has angles 90° , 45° , and x . Find x .

- ☐ A. 90°
- ☐ B. 135°
- ☐ C. 45°
- ☐ D. 55°

Q10. Exterior 100° , one remote interior 40° . Other remote angle, using the theorem.

- ☐ A. 140°
- ☐ B. 40°
- ☐ C. 100°
- ☐ D. 60°

Section B - Medium

Q11. Angles in ratio 2:3:4. Largest interior angle?

2 : 3 : 4 parts of 180°

- ☐ A. 80°
- ☐ B. 60°
- ☐ C. 90°
- ☐ D. 100°

Q12. A triangle has one interior angle of 90° and an exterior angle of 150° at a different vertex. Find the interior angle at that second vertex.

- ☐ A. 60°
- ☐ B. 30°
- ☐ C. 90°
- ☐ D. 120°

Q13. A triangle's angles are x , $x+10$, and $x+20$. Find x .

- ☐ A. 40
- ☐ B. 50
- ☐ C. 45

☐ D. 60

Q14. Interiors 50° , 60° , 70° . Exterior at the 70° vertex?



$50^\circ, 60^\circ, 70^\circ$
exterior at 70°

☐ A. 70°

☐ B. 130°

☐ C. 120°

☐ D. 110°

Q15. A triangle's three exterior angles (one at each vertex) sum to how much?

☐ A. 360°

☐ B. 180°

☐ C. 540°

☐ D. 270°

Q16. An exterior angle of a triangle is 3 times one remote interior angle (40°), and the exterior angle equals the sum of both remote angles. Find the other remote angle.

☐ A. 40°

☐ B. 120°

☐ C. 80°

☐ D. 60°

Q17. Exterior at C is 140° , interior A is 60° . Interior B?



ext C= 140° , A= 60°

☐ A. 80°

☐ B. 60°

☐ C. 40°

☐ D. 20°

Q18. Two angles of a triangle are equal, and the third is 40° more than each of them. Find the third angle.

- ☐ A. 70°
- ☐ B. 86.7°
- ☐ C. 60°
- ☐ D. 100°

Q19. A triangle has an exterior angle of 105° at one vertex, and its two remote interior angles are equal. Find each remote interior angle.

- ☐ A. 105°
- ☐ B. 75°
- ☐ C. 52.5°
- ☐ D. 35°

Q20. Right triangle, one acute angle 35° . Third angle, and why 90° is already used.

- ☐ A. 45°
- ☐ B. 65°
- ☐ C. 90°
- ☐ D. 55°

Section C - Challenge

Q21. Angles in ratio 1:2:3. What type of triangle, by angles?

1 : 2 : 3 of 180°

- ☐ A. Right triangle: 30° , 60° , 90°
- ☐ B. Equilateral triangle
- ☐ C. Obtuse triangle
- ☐ D. Not determinable

Q22. A triangle has interior angles x , $2x$, and $3x$. Find the largest exterior angle.

- ☐ A. 90°
- ☐ B. 120°
- ☐ C. 60°
- ☐ D. 150°

Q23. In triangle ABC, angle A = $2 \times$ angle B, and angle C = angle B + 20° . Find angle B.

- ☐ A. 50°
- ☐ B. 40°
- ☐ C. 30°
- ☐ D. 60°

Q24. Extérieurs 100° , 110° , 150° . The three interior angles?

ext 100, 110, 150

interior = 180 minus each

- ☐ A. 80° , 70° , and 30°
- ☐ B. 100° , 110° , and 150°
- ☐ C. 20° , 30° , and 130°
- ☐ D. This triangle cannot exist

Q25. A triangle's angles satisfy angle A + angle B = $3 \times$ angle C. Find angle C.

- ☐ A. 60°
- ☐ B. 45°
- ☐ C. 90°
- ☐ D. 30°

Q26. An exterior angle of a triangle is 130° , and the two remote interior angles are in ratio 2:3. Find the smaller remote interior angle.

- ☐ A. 78°
- ☐ B. 65°
- ☐ C. 52°
- ☐ D. 50°

Q27. Exterior at A is 108° , interior B is 43° . Interior C?



ext A = 108° , B = 43°

- ☐ A. 108°
- ☐ B. 72°

☐ C. 37°

☐ D. 65°

Q28. A triangle has interior angle $C = 60^\circ$, so interior $A + \text{interior } B = 120^\circ$. The exterior angle at A is twice the exterior angle at B . Find interior angle A .

☐ A. 40°

☐ B. 80°

☐ C. 20°

☐ D. 100°

Q29. A triangle's three interior angles are consecutive multiples of 15° (i.e., $15k$, $15(k+1)$, $15(k+2)$ for some integer k). Find k .

☐ A. 2

☐ B. 3

☐ C. 4

☐ D. 5

Q30. $A=70^\circ$, B is 25° more than C . Find C from $B+C=110^\circ$.

☐ A. 42.5°

☐ B. 55°

☐ C. 67.5°

☐ D. 30°

Answer Key

Q1: (B) (b) 50° . $180 - 60 - 70 = 50$.

Q2: (A) (a) 180° . This is the angle sum property, true for every triangle.

Q3: (C) (c) The two remote (non-adjacent) interior angles. This is the exterior angle theorem.

Q4: (A) (a) 90° . $40 + 50 = 90$, the exterior angle by the theorem.

Q5: (D) (d) Linear pair. They sit on a straight line and sum to 180° .

Q6: (B) (b) 60° . $180 \div 3 = 60$ for an equilateral triangle.

Q7: (A) (a) 60° . $180 - 120 = 60$, using the linear pair relationship.

Q8: (B) (b) No, they would already exceed 180° together with any third angle. $100 + 100 = 200$, already more than 180° , before even adding a third angle.

Q9: (C) (c) 45° . $180 - 90 - 45 = 45$.

Q10: (D) (d) 60° . $100 - 40 = 60$, using the exterior angle theorem in reverse.

Q11: (A) (a) 80° . Sum of ratio parts = 9, each part = $180/9 = 20$; largest = $4 \times 20 = 80$.

Q12: (B) (b) 30° . The interior angle at the exterior-angle vertex forms a linear pair with 150° , so it equals $180 - 150 = 30$.

Q13: (B) (b) 50. $x + (x + 10) + (x + 20) = 180$, so $3x + 30 = 180$, giving $3x = 150$ and $x = 50$.

Q14: (D) (d) 110° . Exterior at that vertex = $180 - 70 = 110$, matching the sum of the other two ($50 + 60 = 110$).

Q15: (A) (a) 360° . The sum of the exterior angles of any triangle (one per vertex) is always 360° .

Q16: (C) (c) 80° . Exterior = $3 \times 40 = 120$; other remote = $120 - 40 = 80$.

Q17: (A) (a) 80° . Exterior at C = angle A + angle B, so $140 = 60 + B$, giving $B = 80$.

Q18: (B) (b) 86.7° . Let equal angles = x , third = $x + 40$. $2x + (x + 40) = 180$, so $3x = 140$, $x \approx 46.7$, third ≈ 86.7 .

Q19: (C) (c) 52.5° . Since both remote angles are equal and sum to 105° , each is $105/2 = 52.5$.

Q20: (D) (d) 55° . $180 - 90 - 35 = 55$.

Q21: (A) (a) Right triangle, since the angles are 30° , 60° , 90° . Ratio parts sum to 6, each part = 30, giving $30^\circ, 60^\circ, 90^\circ$ — a right triangle since one angle is exactly 90° .

Q22: (D) (d) 150° . $x + 2x + 3x = 180$, so $x = 30$; interior angles are $30, 60, 90$; the largest exterior angle is opposite the SMALLEST interior angle (30°), giving $180 - 30 = 150$.

Q23: (B) (b) 40° . $2B + B + (B + 20) = 180$, so $4B + 20 = 180$, $4B = 160$, $B = 40$.

Q24: (A) (a) 80° , 70° , and 30° . Each interior angle is 180° minus its exterior angle ($180 - 100 = 80$, $180 - 110 = 70$, $180 - 150 = 30$), and these genuinely sum to 180° , confirming the triangle is valid.

Q25: (B) (b) 45° . Since $A + B + C = 180$ and $A + B = 3C$, substituting gives $3C + C = 180$, so $4C = 180$, $C = 45$.

Q26: (C) (c) 52° . Ratio parts sum to 5, each part = $130/5 = 26$; smaller = $2 \times 26 = 52$.

Q27: (D) (d) 65° . Exterior at A = B + C, so $108=43+C$, giving $C=65$.

Q28: (C) (c) 20° . Exterior at A = $180-A$, exterior at B = $180-B$. Setting $180-A = 2(180-B)$ with $A+B=120$ gives $B=100$, $A=20$ — checking: exterior at A=160, exterior at B=80, and 160 is indeed twice 80.

Q29: (B) (b) 3. $15k+15(k+1)+15(k+2)=180$, so $45k+45=180$, $45k=135$, $k=3$, giving angles $45^\circ, 60^\circ, 75^\circ$.

Q30: (A) (a) 42.5° . $B+C=180-70=110$; $B=C+25$, so $C+25+C=110$, $2C=85$, $C=42.5$.

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