

Grade 8 - Angles in Triangles and Parallel Lines - Answer Key

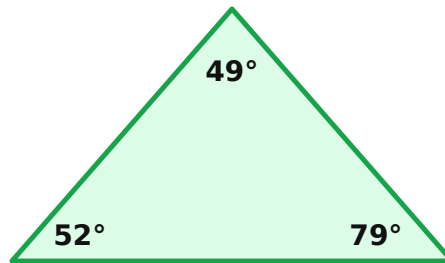
Common Core 8.G.A.5 · maths-pdf.fr/en/

This answer key gives a full worked solution for each of the 21 problems on the angles in triangles and parallel lines worksheet (Common Core 8.G.A.5). Compare each step with your own work, not only the final answer, and note any step where your method differed.

Grade 8 · Common Core State Standards: **8.G.A.5**

Exercise 1 - Third angle

$$180 - 52 - 79 = 49.$$



The third angle is 49° . Not drawn to scale.

49°

Exercise 2 - Angle ratio

$$2x + 3x + 4x = 180, \text{ so } 9x = 180 \text{ and } x = 20.$$

$40^\circ, 60^\circ, 80^\circ$

Exercise 3 - Exterior angle

Exterior angle = sum of remote interior angles.

95°

Exercise 4 - Missing remote angle

$$130 - 50 = 80.$$

80°

Exercise 5 - Vertical angles

Vertical angles are equal: $3x + 10 = 5x - 20$, so $30 = 2x$ and $x = 15$.

$$\text{Angle: } 3 \cdot 15 + 10 = 55.$$

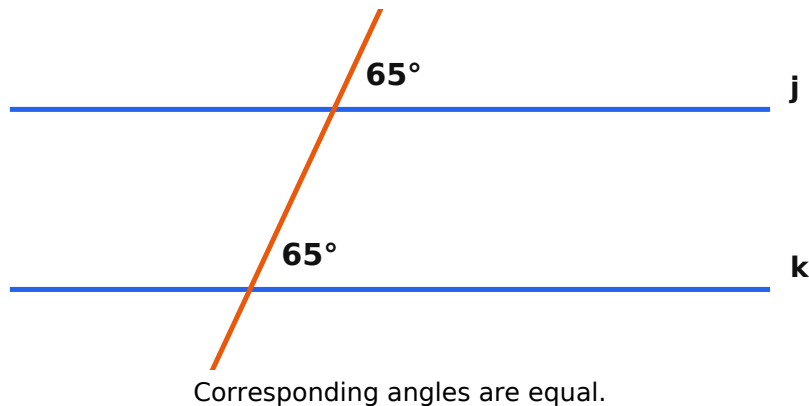
$$x = 15; \mathbf{55^\circ}$$

Exercise 6 - Linear pair

$$180 - 112 = 68.$$

68°

Exercise 7 - Corresponding angles



The angles are in the same position, so they are corresponding angles.

65° , corresponding angles

Exercise 8 - Alternate interior

The marked angle and the 70° angle are alternate interior angles, so they are equal.

70°

Exercise 9 - Solve with corresponding angles

Corresponding angles are equal: $4x+5=65$, so $4x=60$.

$$x=15$$

Exercise 10 - Co-interior angles

Same-side interior angles add to 180: $6x+30=180$, so $x=25$.

Angles: $4\cdot 25+10=110$ and $2\cdot 25+20=70$.

$$x=25; \mathbf{110^\circ \text{ and } 70^\circ}$$

Exercise 11 - All eight angles

Angles equal to 65° : vertical, corresponding and alternate interior angles (four in all).

The rest are supplementary: $180-65=115$.

Four angles measure 65° , four measure 115°

Exercise 12 - AA similarity

Triangle 1 third angle: 70. Triangle 2 third angle: 40. Both have angles 40° , 70° , 70° .

Yes, similar

Exercise 13 - Another similarity check

P: third angle 70. Q: third angle 40.

Angles 50, 60, 70 versus 40, 60, 80 do not match.

No, not similar

Exercise 14 - Prove the exterior angle

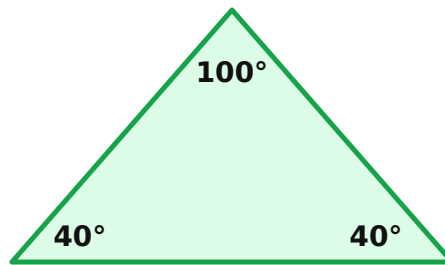
The interior angles satisfy $a+b+c=180$, so $a+b=180-c$.

The exterior angle at c forms a linear pair with c , so it equals $180-c$.

Exterior angle = $a + b$

Exercise 15 - Roof truss

$2x+100=180$, so $2x=80$ and $x=40$.



Base angles are 40° . Not drawn to scale.

40°

Exercise 16 - Street map

The matching corresponding angle at the other crossing is 72° .

The same-side partner is $180-72=108$.

108°

Exercise 17 - Sign angles

$3x+30=180$, so $x=50$.

$50^\circ, 60^\circ, 70^\circ$

Exercise 18 - Garden exterior angle

Other remote angle: $112 - 47 = 65$.

Interior angle at that corner: $180 - 112 = 68$.

65° ; 68°

Exercise 19 - Check the triangle

$85 + 60 + 40 = 185$, which is not 180.

No

Exercise 20 - Angle puzzle

$A + 2A + (A + 30) = 180$, so $4A = 150$ and $A = 37.5$.

$A = 37.5^\circ$, $B = 75^\circ$, $C = 67.5^\circ$

Exercise 21 - Explain the angle sum

A line through the top vertex parallel to the base makes two alternate interior angles equal to the base angles. Together with the top angle they form a straight angle of 180° .

$a + b + c = 180^\circ$