

Grade 7 - Drawing Triangles from Given Conditions - Answer Key

Common Core 7.G.A.2 · maths-pdf.fr/en/

Use this answer key to check your work on the drawing triangles worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer is different, compare each step and look for the first place where the work changes.

Grade 7 · Common Core State Standards: **7.G.A.2**

Exercise 1 - Check 3, 4, 5

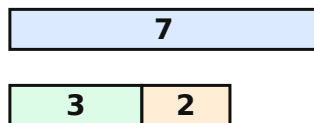
$$3+4=7>5.$$

Yes

Exercise 2 - Check 2, 3, 7

$$2+3=5, \text{ which is less than } 7.$$

No



3 + 2 = 5 versus 7: Gap: the short sticks fall short

$$2 + 3 = 5 \text{ is less than } 7.$$

Exercise 3 - Exactly equal

$$5+5=10, \text{ which is not greater than } 10. \text{ The sides lie flat.}$$

No

10

5 5

$5 + 5 = 10$ versus 10: Just reach: flat, no triangle

The sticks lie flat.

Exercise 4 - A right triangle?

$6+8=14 > 10$, $6+10=16 > 8$, $8+10=18 > 6$.

All three sums work

Exercise 5 - Angles that fit

$50+60+70=180$, so they fit.

Any enlarged or reduced copy has the same angles, so the triangle is not unique.

Yes; many triangles

Exercise 6 - Angles that don't fit

$90+60+40=190 \neq 180$.

No

Exercise 7 - How many triangles?

$4+6=10 > 7$, so a triangle exists.

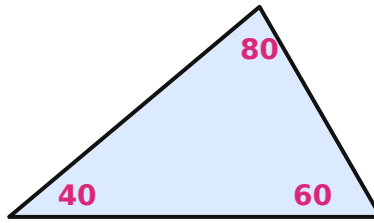
Three fitting side lengths give exactly one shape.

Exactly one

Exercise 8 - Third angle

$180-40-60=80$

80°



The angles are 40, 60, 80.

Exercise 9 - Range of the third side

The third side must be less than $5+8=13$ and greater than $8-5=3$.

Between 3 in and 13 in (not including 3 or 13)

Exercise 10 - Included angle

The triangle is isosceles, so the two base angles are equal: $(180-60)\div 2=60$.

All angles are 60° , so it is equilateral with all sides 4 in.

Angles 60° , 60° ; third side 4 in

Exercise 11 - Unique or not?

Two angles and the side between them fix the triangle, so it is unique.

$$180-35-65=80$$

Unique; 80°

Exercise 12 - Isosceles perimeter

$$(20-8)\div 2=6.$$

$$\text{Check: } 6+6=12>8.$$

6 in

Exercise 13 - Describe the drawing

1. Draw a 5-inch base.
2. With the compass at one end, draw an arc of radius 4 in; at the other end, an arc of radius 3 in.
3. Join the point where the arcs meet to both ends of the base.

One triangle (right angle opposite the 5-inch side)

Exercise 14 - Right isosceles

The angles add to 180, but triangles of different sizes share them.

Giving one side length, such as a leg of 4 in, makes it unique.

Not unique; give one side

Exercise 15 - Craft sticks

$7+3=10$, which equals the longest stick.

No, the sticks lie flat

Exercise 16 - Whole-number third side

The third side is greater than $9-6=3$ and less than $6+9=15$.

Whole numbers: 4, 5, ..., 14, which is $14-4+1=11$ values.

11 lengths

Third side	Possible?
3	no ($6 + 3 = 9$)
4	yes
14	yes
15	no ($6 + 9 = 15$)

The third side must be between 3 and 15.

Exercise 17 - Three towns

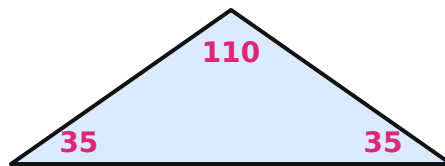
$$5+8=13>12.$$

Yes

Exercise 18 - Roof truss

$$180-35-35=110$$

$$110^\circ$$



Truss angles: 35, 35, 110.

Exercise 19 - Perimeter 30

$$30-9-12=9.$$

$$\text{Check: } 9+9=18>12.$$

9 in

Exercise 20 - Tent base

The base must be greater than 0 and less than $5+5=10$.

9 lengths (1 through 9 ft)