

Area of a Triangle: Secret Code Practice

Leveled practice · ages 11–12 (grade 6) · 45 min

Name: _____ Class: _____ Date: _____

7 cm given ? unknown formula

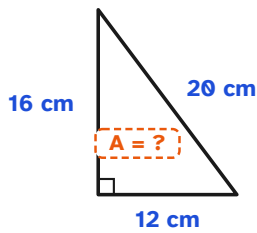
Solve each problem in the grid. Find your answer in the bank (page 2) and write its letter in the box. If all your answers are right, the letters spell a message.

$$A = \frac{b \cdot h}{2} \quad \text{The height } h \text{ makes a right angle with the base } b.$$

●○○ Level 1 • Using the figure

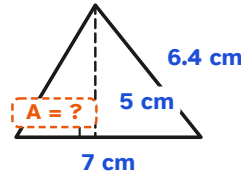
Every labeled segment is given: choose which ones to use. Figures not to scale.

1 Find the area.



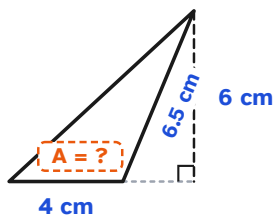
Answer: _____ Letter

2 Find the area.



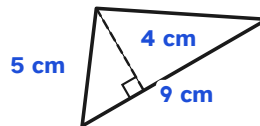
Answer: _____ Letter

3 Find the area.



Answer: _____ Letter

4 Find the area.



Answer: _____ Letter

●●○ Level 2 • Word problems

5 A triangular garden has a base of 12 m and a height of 8 m. How many m² of grass do you need?

Answer: _____ Letter

6 A triangular sail has a base of 2.4 m and a height of 3 m. How much fabric does it take?

Answer: _____ Letter

- 7 Find the area of a triangle with a base of 50 cm and a height of 1.2 m. Give the answer in m^2 .

Answer: _____ Letter ☐

- 8 A triangular parking lot has a base of 40 m and a height of 25 m. Paving costs \$30 per m^2 . How much does it cost to pave it?

Answer: _____ Letter ☐

●●● Level 3 • Working backward

Hint: the rectangle with the same base and height has twice the area, so $b \cdot h = 2 \cdot A$.

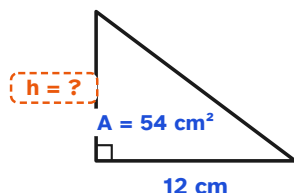
- 9 A triangle has an area of 750 m^2 and a height of 50 m. How long is its base?

Answer: _____ Letter ☐

- 10 A triangle with an area of 36 cm^2 has a base of 9 cm. What is its height?

Answer: _____ Letter ☐

- 11 What is the height?



Answer: _____ Letter ☐

- 12 If you double both the base and the height, what happens to the area? Try it with $b = 4 \text{ cm}$ and $h = 3 \text{ cm}$.

Answer: _____ Letter ☐

Answer bank no units

0.3	T	3.6	C	4	G	4.5	B	7.2	N	8	O	9	R
12	R	13	A	15	L	17.5	E	18	F	22.4	K	24	P
30	C	35	M	36	U	48	E	96	P	108	H	192	D
500	W	1,500	K	3,000	Y	15,000	S	30,000	V	$\times 2$	N	$\times 4$	E

Secret code

1	2	3	4	5	6	7	8	9	10	11	12		



Check your answers with the step-by-step solution: zapcalculator.com/area-of-a-triangle
Free to use in the classroom · CC BY 4.0

For the teacher (do not photocopy)

Goal: identify the base and the perpendicular height (also when the height falls outside the triangle or the triangle is rotated), find the area and work backward to the base or the height.

When: practice or homework, after seeing that a triangle is half of a rectangle. **Time:** 45 min. **Materials:** calculator (optional).

Standard: CCSS 6.G.A.1.

Secret message: PERFECT SCORE.

Answer key

- $12 \times 16 \div 2 = 96 \text{ cm}^2$ (the legs are the base and the height)
- $7 \times 5 \div 2 = 17.5 \text{ cm}^2$
- $4 \times 6 \div 2 = 12 \text{ cm}^2$ (the height falls outside the base)
- $9 \times 4 \div 2 = 18 \text{ cm}^2$
- $12 \times 8 \div 2 = 48 \text{ m}^2$
- $2.4 \times 3 \div 2 = 3.6 \text{ m}^2$
- $0.5 \times 1.2 \div 2 = 0.3 \text{ m}^2$
- $40 \times 25 \div 2 = 500 \text{ m}^2$; $500 \times 30 = \$15,000$
- $b = 2 \times 750 \div 50 = 30 \text{ m}$
- $h = 2 \times 36 \div 9 = 8 \text{ cm}$
- $h = 2 \times 54 \div 12 = 9 \text{ cm}$
- $4 \times 3 \div 2 = 6 \rightarrow 8 \times 6 \div 2 = 24$: the area is multiplied by 4

The mistake behind each answer in the bank

Answer	#	Mistake	Answer	#	Mistake
192	1	didn't divide by 2	30	7	mixed cm and m
48	1	added the three sides (perimeter)	3,000	7	left the answer in cm^2
35	2	didn't divide by 2	$500 / 30,000$	8	stopped at the area / didn't divide by 2
22.4	2	used the slanted side	$15 / 1,500$	9	$750 \div 50$ without the 2 / didn't divide by the height
13 / 24	3	used the 6.5 cm side / didn't divide by 2	4	10	$36 \div 9$
36	4	didn't divide by 2	$4.5 / 108$	11	$54 \div 12$ / didn't divide by the base
$96 / 7.2$	$5 / 6$	didn't divide by 2	$\times 2$	12	thought it doubles

Mistakes to watch for

- Using the slanted side as the height.
- Forgetting to divide by 2, or working backward with $b = A \div h$ (without the 2).
- Mixing units (cm with m, cm with cm^2).

Exit ticket

Can an obtuse triangle have its height outside? Draw one and show where the right angle goes.