

Area of Triangles

Flagship

Lesson 5-3-flagship

Name: _____

Date: _____

Class: _____

SKY HARBOR MISSION

| The Triangular Skylight

You are the lead architect at Sky Harbor Studio. The city has hired your firm to design a glass skylight made of triangular panels for the new transit hub. Before the glass can be cut, you must master the area of triangles — every wrong measurement wastes expensive glass.

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

*If the bottom of a triangle is 10 cm, then $b = 10$ cm
in the formula $A = \frac{1}{2} \times b \times h$*

Base

A side of the triangle you use to find the area.

*A dashed vertical line from the top point straight
down to the base at a 90° angle*

Height

The straight-up distance from the base to the top corner.

*A triangle with $b = 8$ and $h = 6$ has area = $\frac{1}{2} \times 8 \times$
 $6 = 24$ sq units*

Area

How much space is inside a flat shape.

*The corner of a book or a door frame meets at
exactly 90°*

Perpendicular

Two lines that meet to make a square corner (90 degrees).

*A house shape = a rectangle (walls) + a triangle
(roof)*

Composite figure

A shape made by putting two or more simple shapes together.

*$A = \frac{1}{2} \times b \times h$ means Area equals one-half times
base times height*

Formula

A math rule written with symbols.

Key Ideas & Notes

- Your architecture firm is designing a park with triangular garden beds.
- The client wants to know exactly how much soil to order, which means calculating the area of each triangular section.
- The first garden has a base of 12 feet and a height of 8 feet.
- Plot the vertices of a triangle with base 12 and height 8.

Think About It

- What shape are the garden beds?
- What measurements do we need to find the area?
- How is the area of a triangle related to the area of a rectangle?

My Notes

Guided Examples

Example 1

What is the area of a triangle with base 10 cm and height 6 cm?

Solution: $A = \frac{1}{2} \times b \times h = \frac{1}{2} \times 10 \times 6 = 30$ square centimeters.

Answer: A. 30 sq cm

Example 2

A triangle has an area of 24 sq ft and a base of 8 ft. What is the height?

Solution: $24 = \frac{1}{2} \times 8 \times h \rightarrow 24 = 4h \rightarrow h = 6$ ft.

Answer: A. 6 ft

Example 3

What is the area of a triangle with base 14 ft and height 6 ft?

Solution: $A = \frac{1}{2} \times 14 \times 6 = \frac{1}{2} \times 84 = 42$ sq ft.

Answer: A. 42 sq ft

Write About the Math

The Writing Revolution

I can explain my steps using the words base, height, area, and perpendicular.

1. Kernel Sentence subject + verb

Model: Area is how much space is inside a flat shape.

Área es cuánto espacio hay dentro de una figura plana.

Write a kernel sentence about area. Use a subject and a verb.

Escribe una oración base sobre área. Usa un sujeto y un verbo.

2. Sentence Expansion because · but · so

Kernel: Area matters in math

Área importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because
porque

Area matters in math because ____.

Área importa en matemáticas porque ____.

but
pero

Area matters in math, but ____.

Área importa en matemáticas, pero ____.

so
entonces

Area matters in math, so ____.

Área importa en matemáticas, entonces ____.

3. Sentence Types 4 ways to write a math idea

Statement
Afirmación

Tell one true fact about area.
Di un hecho verdadero sobre area.

Area ____.

Question
Pregunta

Ask a question about area.
Haz una pregunta sobre area.

How does ____ ?

¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about area.
Muestra entusiasmo sobre area.

Wow, ____ !

¡Guau, ____ !

Command
Mandato

Tell a partner what to do with area.
Dile a un compañero qué hacer con area.

First, ____ .

Primero, ____ .

4. Explain Your Reasoning use a sentence starter

I know ____ **because** ____ .

Sé que ____ *porque* ____ .

First I ____ , **then I** ____ .

Primero ____ , *luego* ____ .

This is important because ____ .

Esto es importante porque ____ .

Try It

Solve on your own. Check the answer key when you are done.

1. A triangle has an area of 24 sq ft and a base of 8 ft. What is the height?

- A. 6 ft
- B. 3 ft
- C. 16 ft
- D. 12 ft

Show your work:

2. What is the area of a triangle with base 14 ft and height 6 ft?

- A. 42 sq ft
- B. 84 sq ft
- C. 20 sq ft
- D. 42 ft

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A rectangle is 12 ft by 8 ft. A diagonal line cuts it into two triangles. What is the area of each triangle? Explain how the triangle area formula relates to the rectangle area formula.

Sentence starter: The rectangle's area is ___ because ___. Each triangle's area is ___ because a diagonal splits a rectangle into ___ equal triangles.

Show your work:

Reflect — Exit Ticket

A triangle has a base of 11 inches and a height of 8 inches. What is its area?

- A. 44 sq in
- B. 88 sq in
- C. 19 sq in
- D. 44 in

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. $6 \text{ ft} - 24 = \frac{1}{2} \times 8 \times h \rightarrow 24 = 4h \rightarrow h = 6 \text{ ft}$.
2. **Try It 2:** A. $42 \text{ sq ft} - A = \frac{1}{2} \times 14 \times 6 = \frac{1}{2} \times 84 = 42 \text{ sq ft}$.
3. **Exit Ticket:** A. $44 \text{ sq in} - A = \frac{1}{2} \times 11 \times 8 = \frac{1}{2} \times 88 = 44 \text{ square inches}$.

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Area is how much space is inside a flat shape.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).