



G3-G4
Basic

G4-G5
Advanced

Helping With Math

GRADES

Spatial Skills:
Triangles and Quadrilaterals

Suitable for students
aged 7-10



This pack is suitable for learners aged 7 to 10 years old or 3rd to 5th grades. The content covers fact files and relevant basic and advanced activities of triangles and quadrilaterals topics that aim to develop and strengthen the learners' spatial skills.

It's time for Winter Solstice!



The **Winter Solstice** occurs between December 20 to 23. This marks the shortest day of the year. This is also called *December Solstice*. A solstice happens when the Earth's pole reaches its maximum tilt away from the Sun.

Spatial Skills



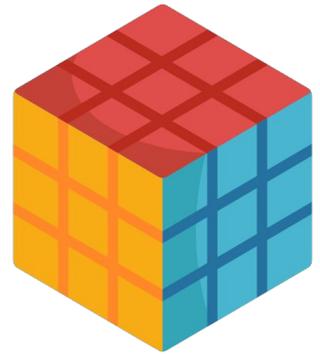
Spatial skills enable us to mentally visualize, manipulate, and organize spatial relationships in real life. Using this skills can help us identify the physical space in the objects that we use in our daily lives.



CONCEPTS

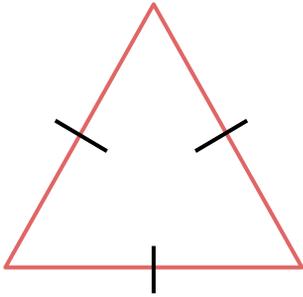
SPATIAL SKILL

- This is the ability to reason, understand, and remember the spatial relationships among each objects.
- There are four types: *spatial perception, spatial visualization, mental folding, and mental rotation.*
- It is said that spatial skills are related to mathematical learning and performance.
- Young children can already learn spatial skills through words being used by their parents. Words that are used describe the size (*big, enormous, wide, etc.*), shapes (*round, square, diamond, etc.*) and spatial concepts (*over, under, beside, etc.*).
- Having this skill allows us to be conscious of the things in our environment, like the following:
 - ★ Location - This helps us identify the location of an object.
 - ★ Movement - This skill helps you to navigate your surroundings and inform you how people and objects move.
 - ★ Social - This can affect social functions by helping you identify the personal space of a person.
 - ★ Reading & Writing - This helps us understand the sentence structure and grammar.
 - ★ Mathematics - This helps us to understand geometry and arranging numbers



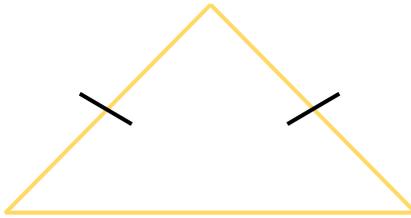
TRIANGLES

- A triangle is described as a three-sided polygon which closes in a space.
- To form the three sides, it uses lines, line segments or rays.
- A triangle has three sides, three angles and three vertices.



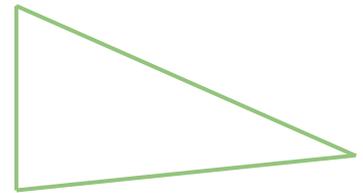
EQUILATERAL

Triangle with all three sides having the same lengths.



ISOSCELES

Triangle with two sides having the same lengths.



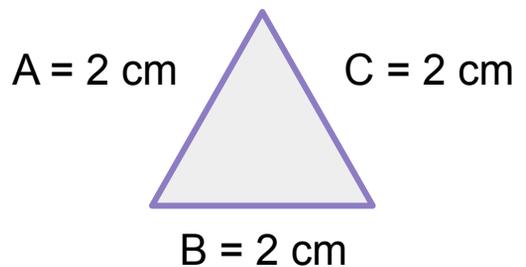
SCALENE

Triangle with all sides not having the same lengths.

PERIMETER OF TRIANGLE

The perimeter of a triangle is the total distance covered by a triangle which can be calculated by adding all the sides of the triangle.

$$P = a + b + c$$



$$P = a + b + c$$

$$P = 2 \text{ cm} + 2 \text{ cm} + 2 \text{ cm}$$

$$P = 6 \text{ cm}$$

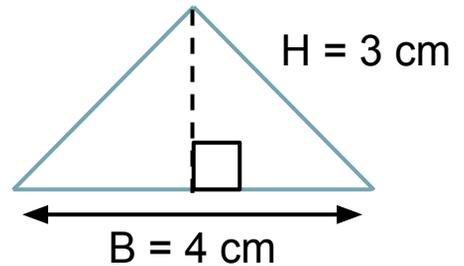


AREA OF TRIANGLE

The area of a triangle can be defined as the total space or region which is enclosed inside any types of triangle.

$$A = \frac{1}{2} \times b \times h$$

b = base; h = perpendicular height



$$A = \frac{1}{2} \times b \times h$$

$$A = \frac{1}{2} \times 4 \text{ cm} \times 3 \text{ cm}$$

$$A = \frac{1}{2} \times 12 \text{ cm}^2$$

$$A = 6 \text{ cm}^2$$

QUADRILATERALS

- A quadrilateral is a 2 dimensional shape which is closed, and has straight sides.
- “Quad” means four and “lateral” means side.
- Quadrilaterals have four sides, four vertices, and interior angles adding up to 360° .



SQUARE

All four sides are equal.

All angles are right angles.

Opposite sides are parallel.

Diagonals bisect each other.



QUADRILATERALS



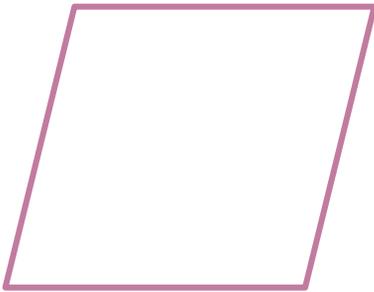
RECTANGLE

All angles are right angles.

Opposite sides are equal.

Opposite sides are parallel.

Diagonals bisect each other.



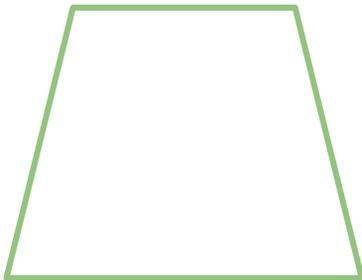
PARALLELOGRAM

Opposite sides are parallel.

Opposite sides are equal.

Opposite angles are equal.

Diagonals bisect each other.

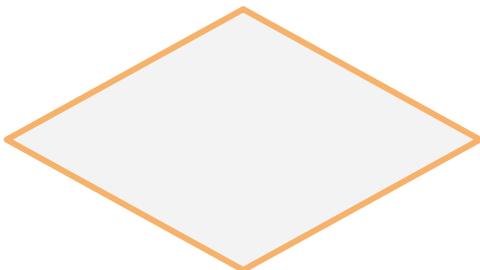


TRAPEZOID

Opposite sides are parallel.

Legs are congruent.

Adjacent angles add up to 180° .



RHOMBUS

All sides are equal.

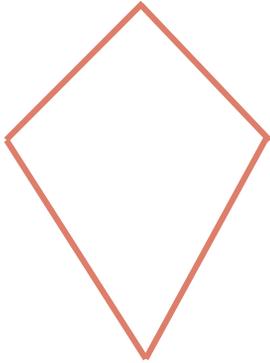
Opposite angles are equal.

Opposite sides are parallel.

Diagonals bisect each other.



QUADRILATERALS



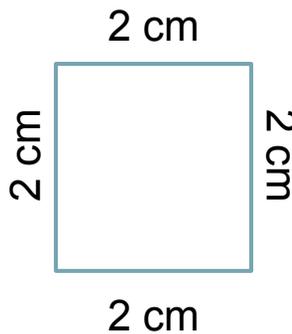
Adjacent pairs of sides are equal.

Diagonals are perpendicular.

PERIMETER OF QUADRILATERALS

The perimeter of a quadrilateral is the sum of the lengths of its sides.

$$P = a + b + c + d$$



$$P = a + b + c$$

$$P = 2 \text{ cm} + 2 \text{ cm} + 2 \text{ cm} + 2 \text{ cm}$$

$$P = 6 \text{ cm}$$

AREA OF QUADRILATERALS

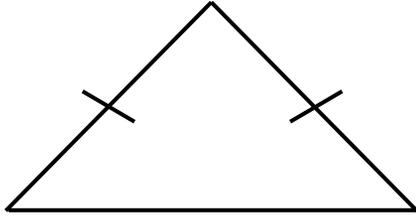
The area is the region that can be found in the quadrilaterals.

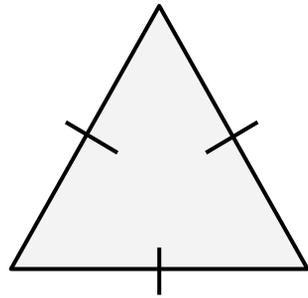
Rectangle, Parallelogram, Rhombus	Base x Height
Square	Length x Length
Trapezoid	$\frac{1}{2} (a+b)h$

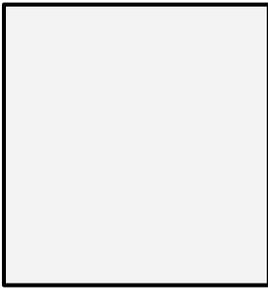


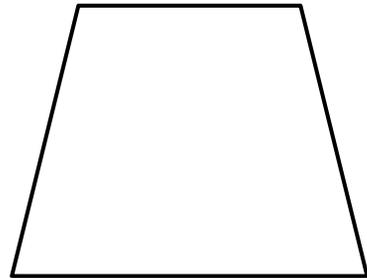
LET'S PRACTICE!

Identify the given triangles and quadrilaterals below.









Provide the perimeter and area of the rectangle below.



PERIMETER	AREA



TABLE OF ACTIVITIES

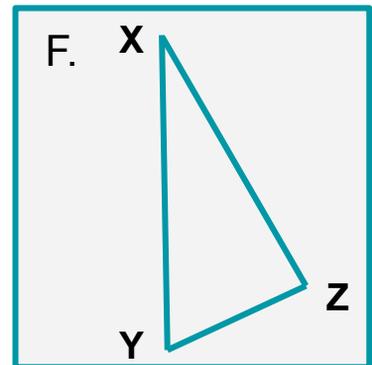
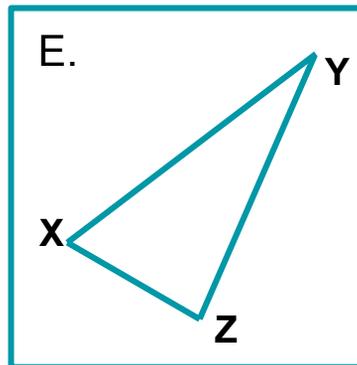
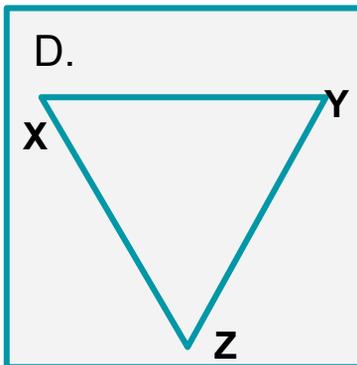
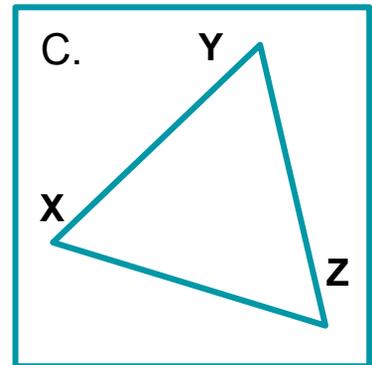
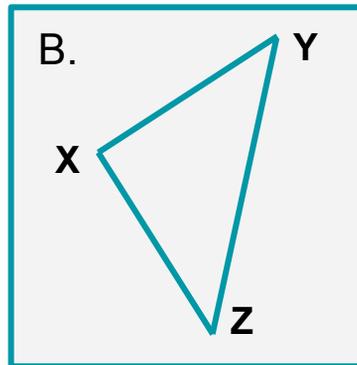
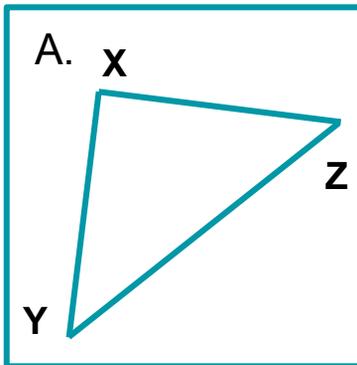
Ages 7-9 (Basic)		<u>G3 - G4</u>
1	The Day Has Come	
2	Rest and Reawaken	
3	Home Before Sunset	
4	Catch the Solstice	
5	The Solstices	
Ages 8-10 (Advanced)		<u>G4 - G5</u>
6	Perfect View	
7	For My Telescope	
8	Yule Tree	
9	Deer Mother	
10	Make Your Lanterns	



THE DAY HAS COME

G3-G4
Basic

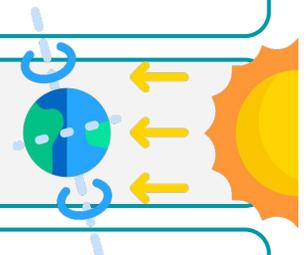
The Winter Solstice is about to happen in a few days. Prepare for it while grouping the triangles according to the types of the triangles - equilateral, isosceles, and scalene. Identify too the sides of the triangles with the same measurement.



EQUILATERAL:

ISOSCELES:

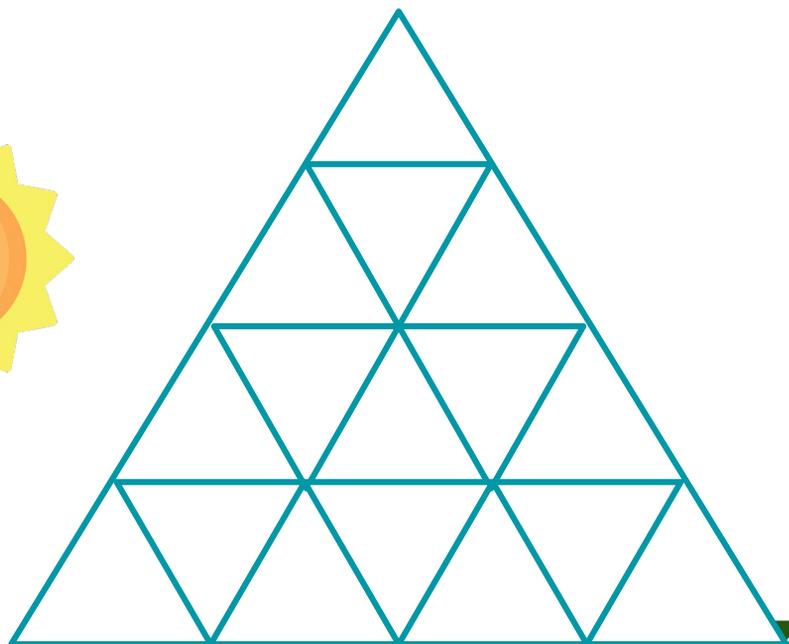
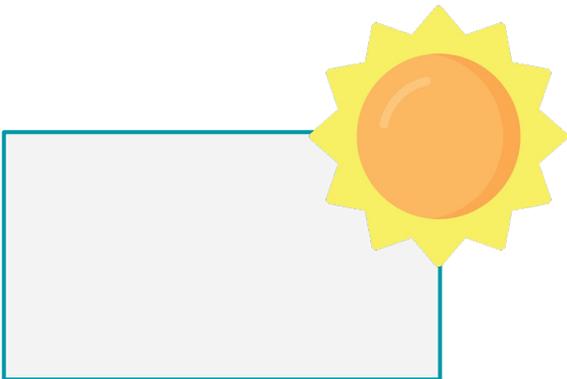
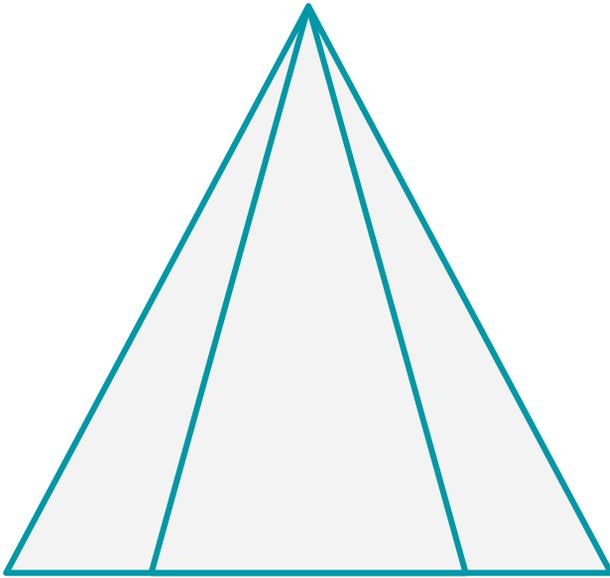
SCALENE:



REST AND REAWAKEN

G3-G4
Basic

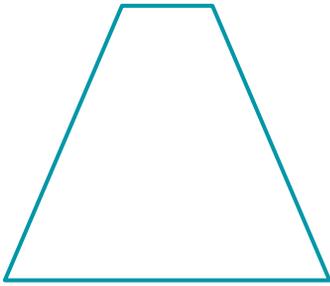
There are many things that you can do during winter solstice. Some of the people consider this as a time to rest for the new beginning that is about to come. While you are doing this, count the number of triangles in the figures below, then identify the types of each.



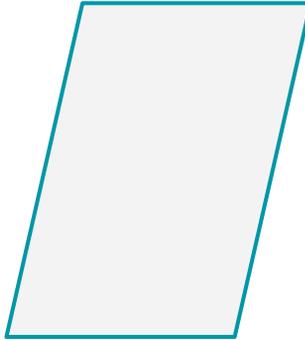
HOME BEFORE SUNSET

G3-G4
Basic

The day of the Winter Solstice is the shortest day of the year. Help Ethan get home before sunset, and identify the quadrilaterals below. Put marks on the sides of the figures with the same length. If there are right angles, identify them too and mark it with 'r'.



1.



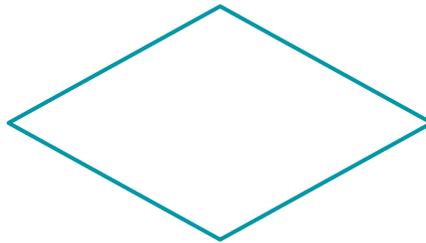
2.



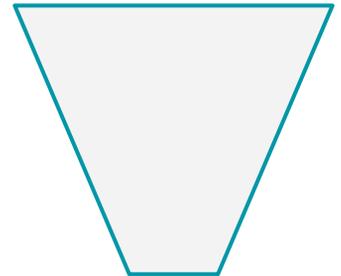
3.



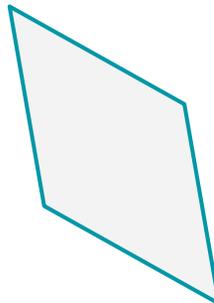
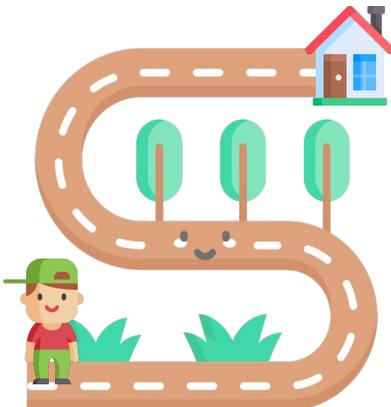
4.



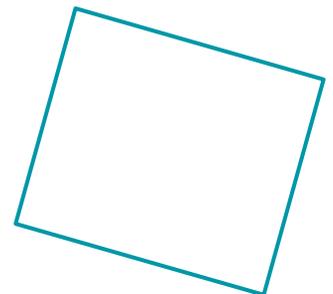
5.



6.



7.



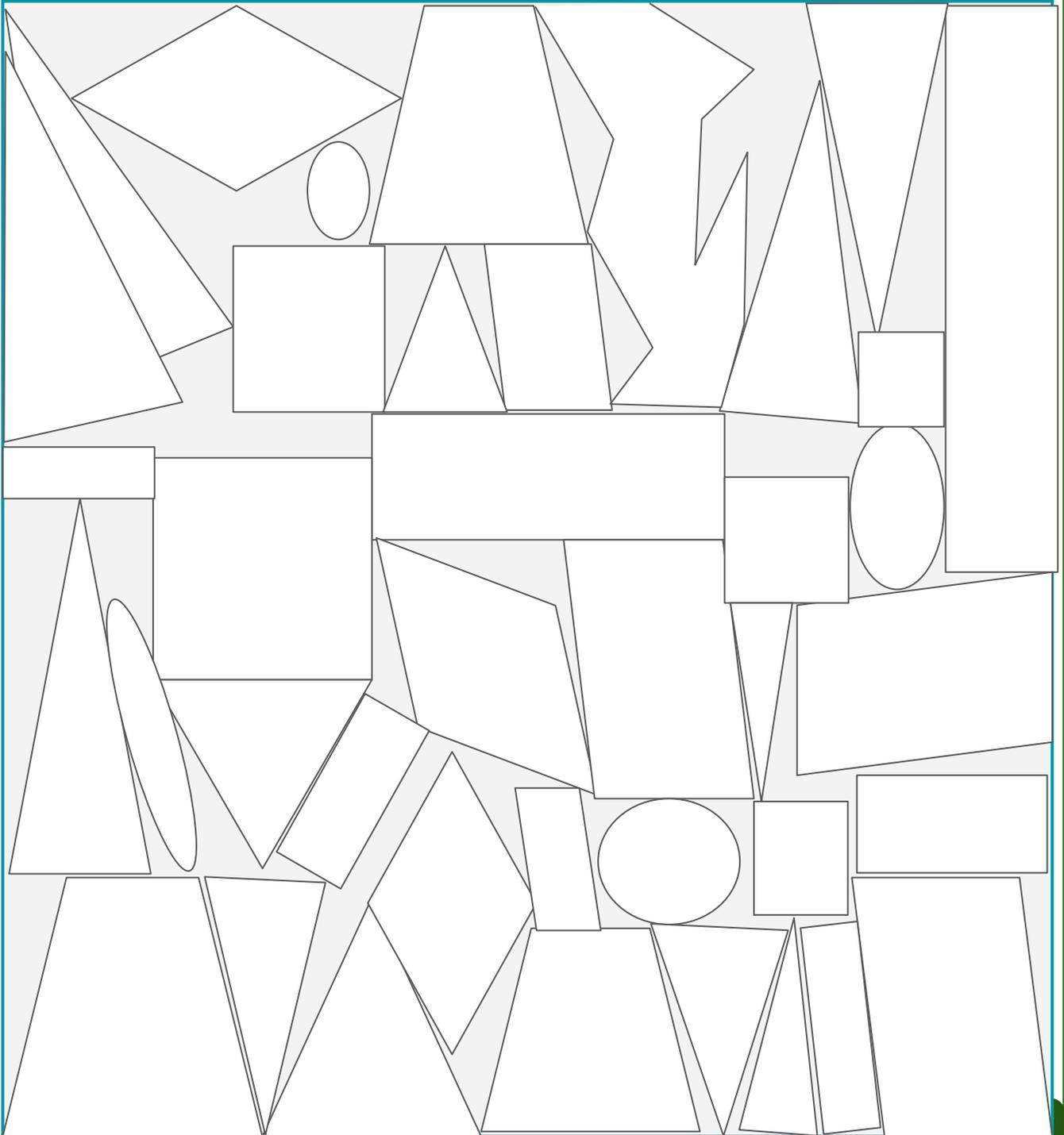
8.



CATCH THE SOLSTICE

G3-G4
Basic

Your things are still disorganized but you need to leave in an hour for the winter solstice. Color the triangles red, and the quadrilaterals blue to help you organize your things faster.



THE SOLSTICES

G3-G4
Basic

There are two kinds of solstice that occurs in a year. Just like the solstice, quadrilaterals too have different types. Read the descriptions below and draw the quadrilaterals being described.

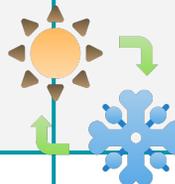
I am a quadrilateral with 4 right angles. My opposite sides are equal and parallel. You can find diagonals that bisect each other.



I am a quadrilateral with equal adjacent pair of sides. The diagonals are perpendicular

I am the type of quadrilateral with equal sides. My opposite angles are equal while the opposite sides are parallel. The diagonals bisect each other too.

I am the type of quadrilateral with opposite sides that are parallel. My legs are congruent and my adjacent angles are equal to 180° .



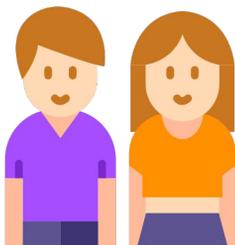
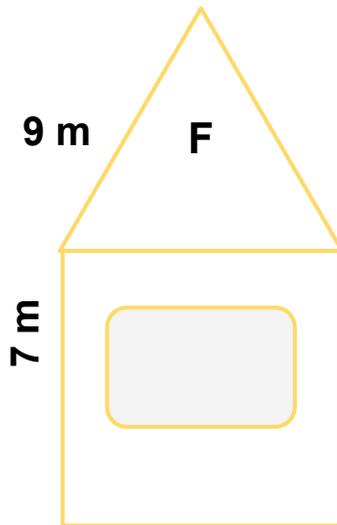
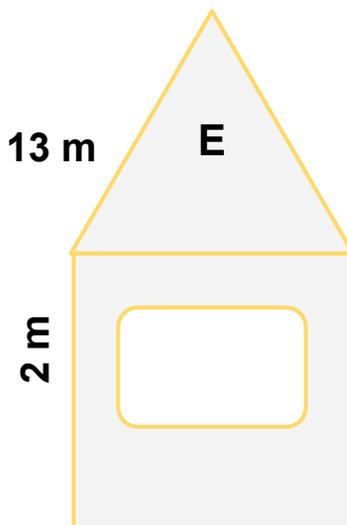
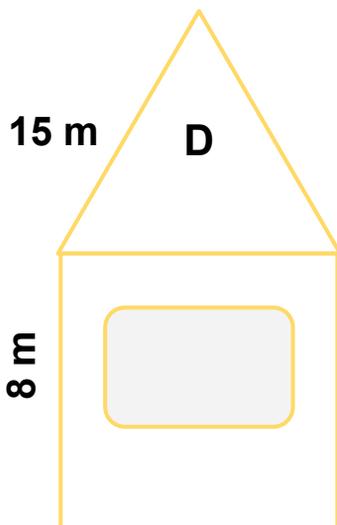
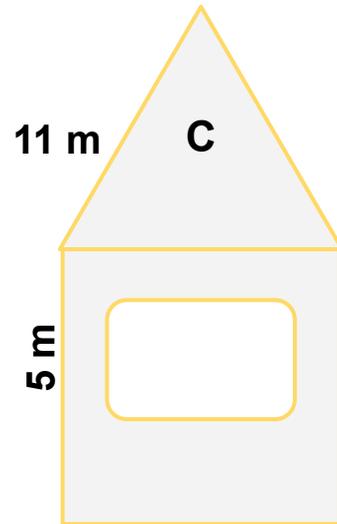
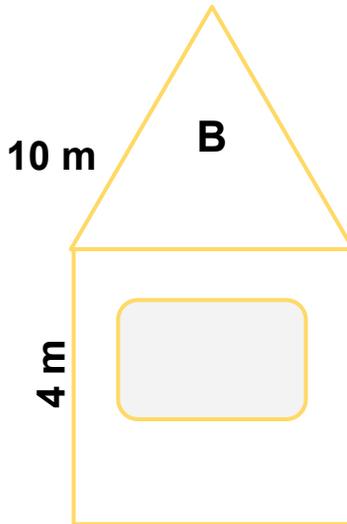
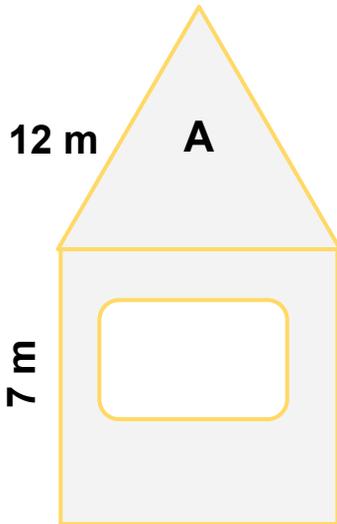
I am a quadrilateral with 4 right angles. My opposite sides are parallel. All my sides are equal. You can find diagonals that bisect each other.



PERFECT VIEW

G4-G5
Advanced

Everyone is very excited to witness the upcoming Winter Solstice. Martin and Grace are planning to view the solstice together. Help them find the best hotel by solving the perimeters below.



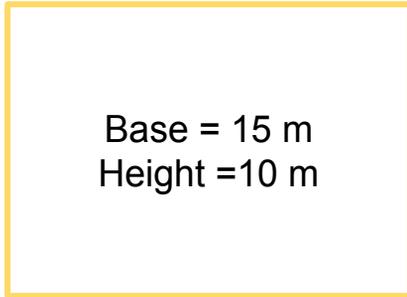
We want to have a good view of the Winter Solstice. Which would be the best place to stay?



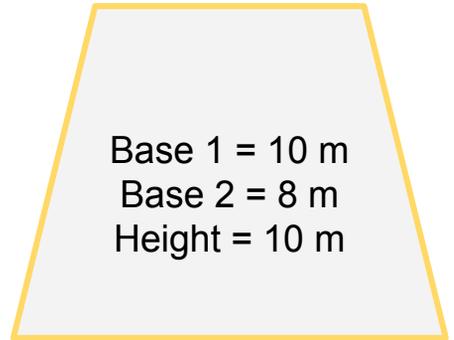
FOR MY TELESCOPE

G4-G5
Advanced

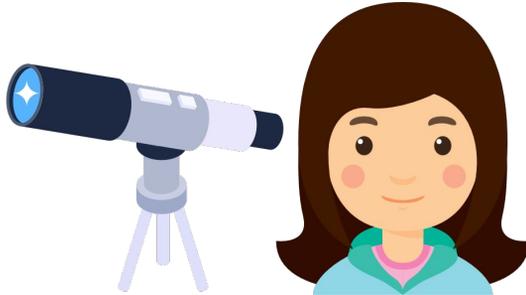
Lily is a fan of all things about astronomy. Help her find the right case for her telescope and calculate the perimeter of each quadrilaterals below.



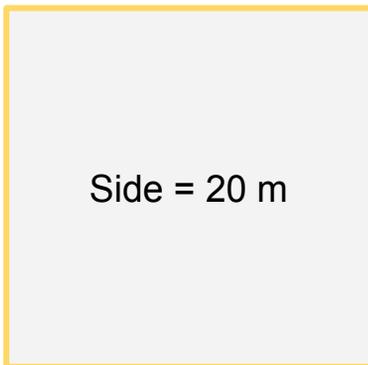
1. _____



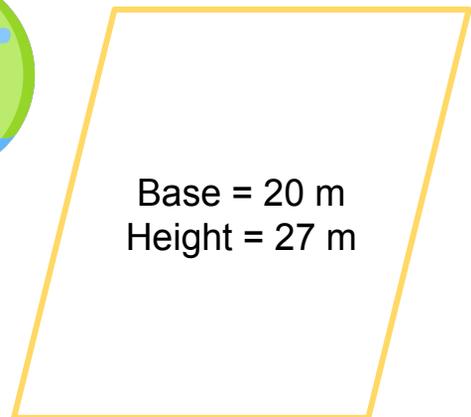
2. _____



My telescope is measured at 27 m. Which box would fit it perfectly?



3. _____



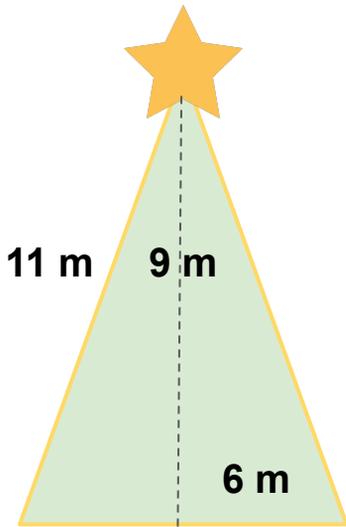
4. _____



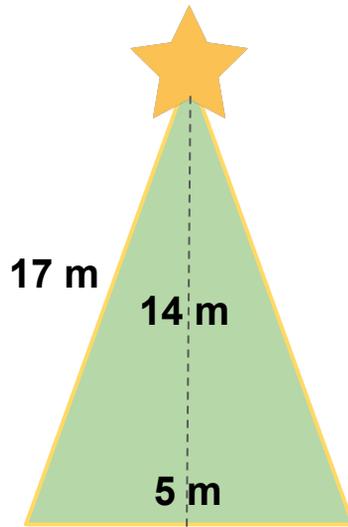
YULE TREE

G4-G5
Advanced

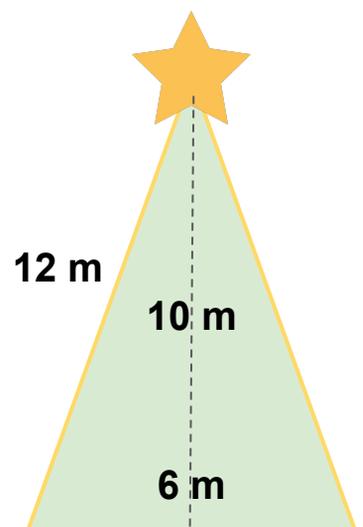
One way of celebrating winter solstice is by creating a Yule Tree. Measure the perimeter and area of the trees below in preparation for the upcoming solstice.



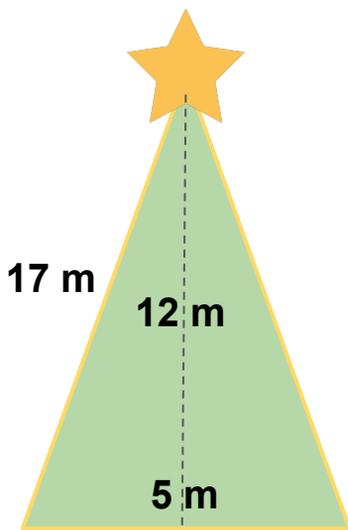
1. _____



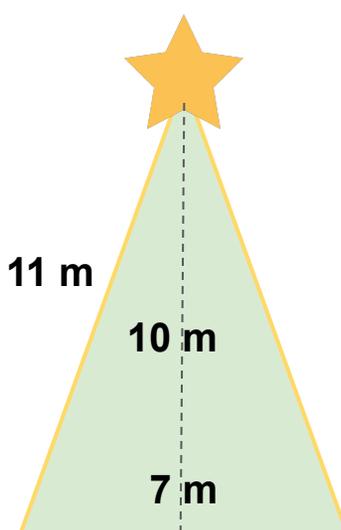
2. _____



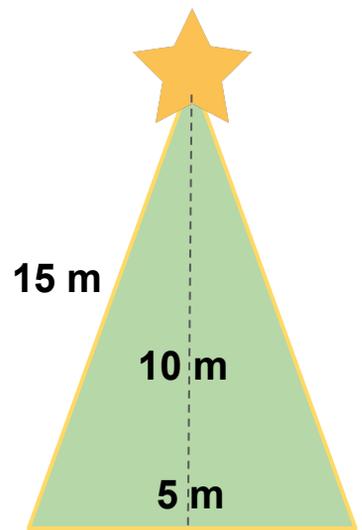
3. _____



4. _____



5. _____



6. _____



DEER MOTHER

G4-G5
Advanced

The Deer Mother is one of the famous folktales during winter solstice. In preparation for this story, answer the given questions below first.

1. Find the perimeter of a triangle with sides measured at 7 m, 10 m and 13 m.

2. Find the perimeter of a triangle with sides measured at 12 m, 15 m, and 4 m.

3. Find the perimeter of a triangle with sides measured at 20 cm, 17 cm and 15 cm.

4. What is the area of a triangle with 8 cm base and 3 cm height?

5. What is the area of a triangle with 12 m base and 5 m height?

6. What is the area of a triangle with 16 m base and 7 m height?



MAKE YOUR LANTERNS

G4-G5
Advanced

Some people prepare Yule Lanterns for the celebration of Winter Solstice. Prepare your lanterns and find what is being asked below.

1. If the area of the triangle is 126 m, and its given base is 21 m, what is its height?

2. If the perimeter of a triangle is 57 m, with given sides of 16 m and 13 m, find the missing side of the triangle.

3. If the area of the triangle is 114 m, and its given height is 12 m, what is its base?

4. If the perimeter of a triangle is 103 m, with given sides of 37 m and 28 m, find the missing side of the triangle.



ANSWER GUIDE

Activity 1

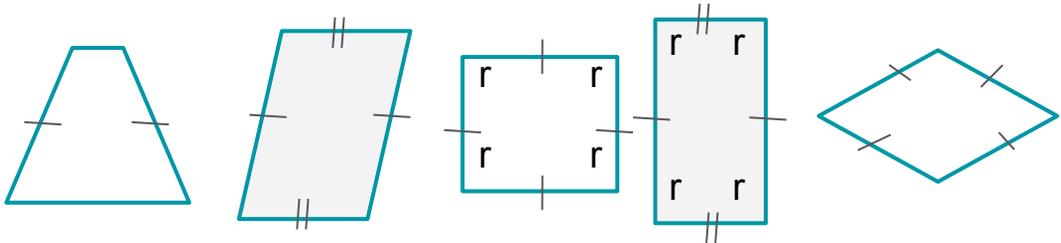
Equilateral: D (XY, YZ, XZ), C (XY, YZ, XZ) | Isosceles: E, (XY, YZ)
F (XY, YZ) | Scalene: A (none), B (none)

Activity 2

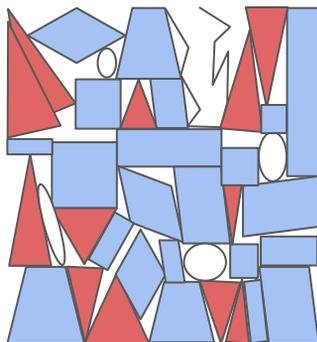
1. 6 triangles: 1 equilateral (biggest), 1 isosceles (center triangle), 4 scalene (the rest)
2. 27 triangles: all equilateral

Activity 3

1. Trapezoid
2. Parallelogram
3. Square
4. Rectangle
5. Rhombus
6. Trapezoid
7. Rhombus
8. Square

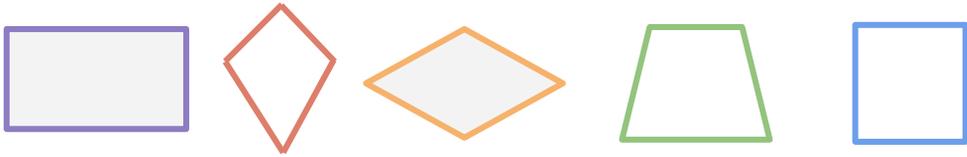


Activity 4



ANSWER GUIDE

Activity 5



Activity 6

A: 62 m B: 48 m C: 54 m D: 76 m E: 56 m F: 50 m
Biggest hotel: D

Activity 7

1. 150 m^2 2. 90 m^2 3. 400 m^2 4. 540 m^2

The telescope is measured in linear meters. The quadrilateral with the perfect height is the parallelogram.

Activity 8

1. Area = 27 m Perimeter = 28 m 2. Area = 35 m Perimeter = 59 m 3.
Area = 30 m Perimeter = 30 m
4. Area = 30 m Perimeter = 59 m 5. Area = 35 m Perimeter = 29 m 6.
Area = 25 m Perimeter = 35 m

Activity 9

1. 30 m 2. 31 m 3. 52 cm 4. 12 cm 5. 30 m 6. 112 m

Activity 10

1. 12 m 2. 28 m 3. 19 m 4. 38 m



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