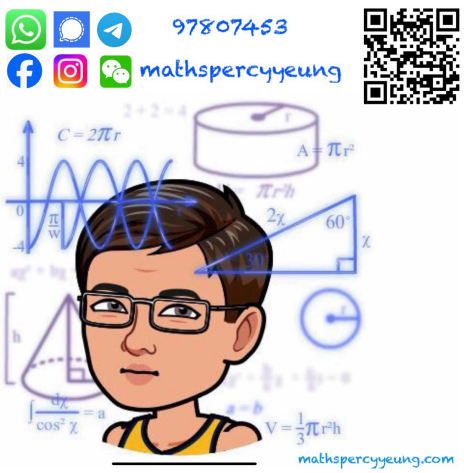
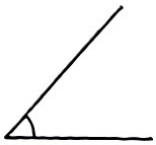
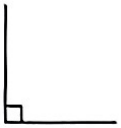
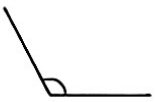


1. Parallel Lines and Perpendicular Lines

If two lines on the same plane do not intersect or meet each other no matter how far they are extended, they are called parallel lines.

If two lines on the same plane meet at a right angle, they are called perpendicular lines.

2. Types of Angles

Acute angle	Right angle	Obtuse angle	Straight angle	Reflex angle
				

3. Types of Triangles

(a) Acute-angled triangle: All angles of the triangle are acute.

(b) Right-angled triangle: One angle of the triangle is a right angle.

(c) Obtuse-angled triangle: One angle of the triangle is obtuse.

(d) Scalene triangle: All the sides of the triangle are unequal in length.

(e) Isosceles triangle: Two of the sides of the triangle are equal in length.

(f) Equilateral triangle: All sides of the triangle are equal in length.

4. Angle Sum of a Triangle

For any triangle, the sum of all interior angles is equal to 180°.

[Ref: $\angle$ *sum of* $\triangle$]

5. Polygons

(a) Equiangular polygon: All the interior angles of the polygon are equal.

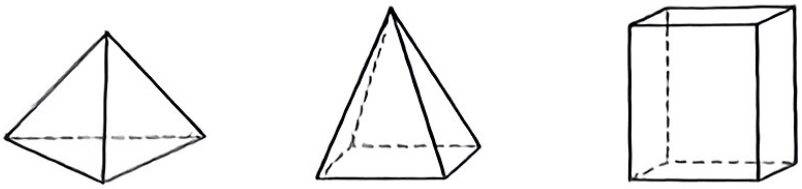
(b) Equilateral polygon: All the sides of the polygon have the same length.

(c) Regular polygon: The polygon is both equiangular and equilateral.

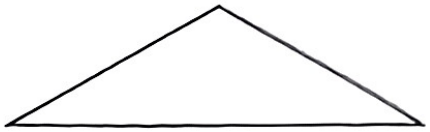
6. Polyhedra

Polyhedra are solids which are made up of polygonal planes.

Example: Regular tetrahedron Pyramid Prism



If two of the angles in a triangle are acute, do you think the remaining one is obtuse? Explain your answer.



Solution:

No, the remaining one may not be obtuse.

① Try to give an example to support your argument:
The sum of angles of a triangle is 180°. Consider a triangle with angles 50° and 60°, the remaining angle is 70°, which is not obtuse.

Determine whether each of the following statements is correct or not.

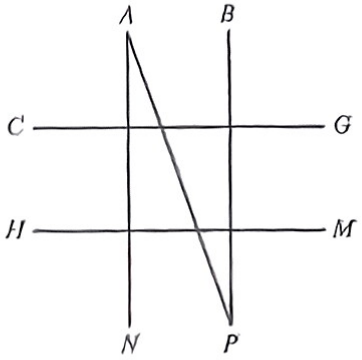
1. A triangle can have more than 1 obtuse angle. ✔ Correct / ✘ Incorrect
2. There are more than 1 way to name an angle of a triangle. ✔ Correct / ✘ Incorrect
3. Perpendicular lines never intersect even when the lines are produced. ✔ Correct / ✘ Incorrect
4. All equiangular polygons are regular polygons. ✔ Correct / ✘ Incorrect
5. Square is a regular polygon. ✔ Correct / ✘ Incorrect

Exercise

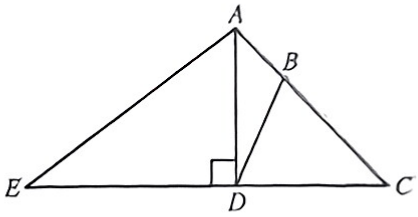
Level 1

1. (a) Write down all parallel lines in the figure.

   (b) Write down two pairs of perpendicular lines in the figure.



2. From the given figure, identify which triangles are acute-angled, obtuse-angled or right-angled triangles.



   (a) Acute-angled triangle:

   _____

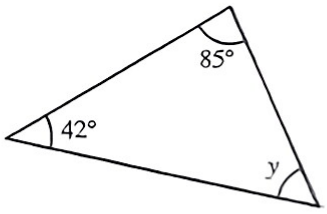
   (b) Obtuse-angled triangle:

   _____

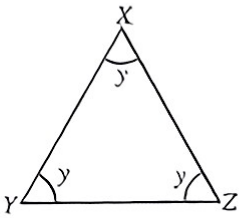
   (c) Right-angled triangle:

   _____

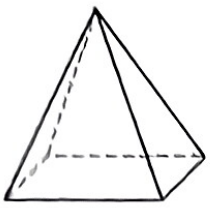
3. In the figure, find y.

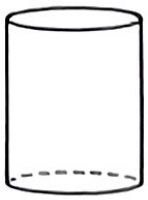


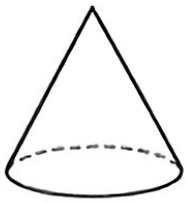
4. In the figure, find y.

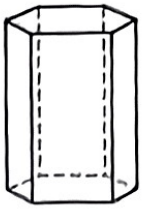


5. Determine whether the following solids are polyhedra.

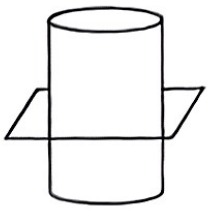
(a) 

(b) 

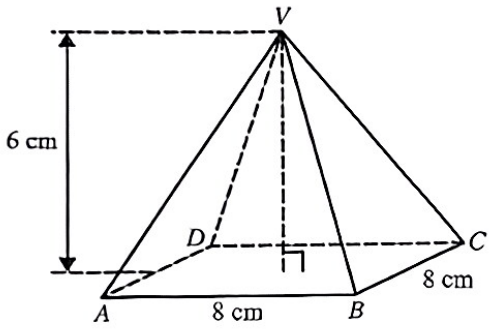
(c) 

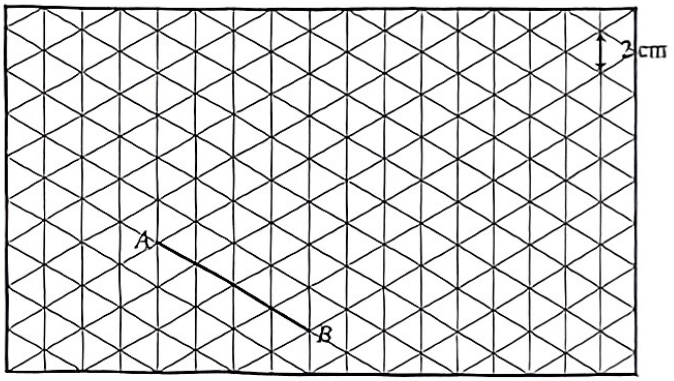
(d) 

6. In the figure, draw the cross-section when the solid is cut along the plane.



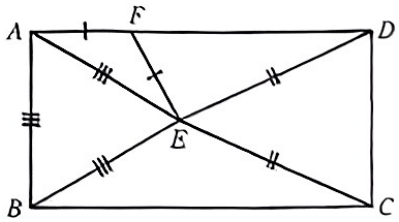
7. The following figure shows a pyramid $VABCD$, where the base $ABCD$ is a square. Draw the pyramid in the isometric grid below.





Level 2

8. Write down the names of all triangles in the figure corresponding to each of the following types.

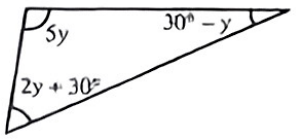


(a) Scalene triangle

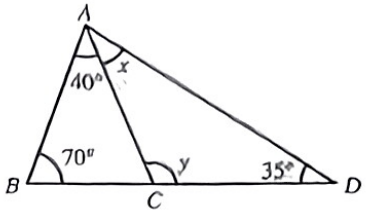
(b) Isosceles triangle

(c) Equilateral triangle

9. In the figure, find y.

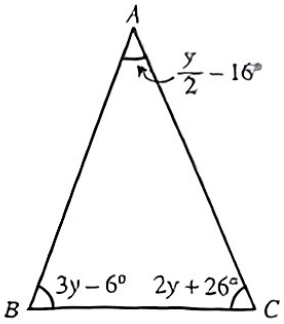


10. In the figure, BCD is a straight line. Find x and y.



11. Cindy drew a triangle as shown on the right. Her teacher found that there are some mistakes in the figure. Find out the mistakes and explain your answer briefly.

Hint Find out the values of the three angles first.



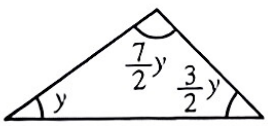
Multiple-choice Questions

12. Which of the following angles cannot form a triangle?

A. 25°, 65°, 90°
B. 28°, 52°, 90°
C. 21°, 73°, 86°
D. 24°, 76°, 80°

13. In the figure, y =

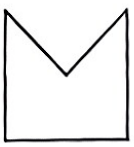
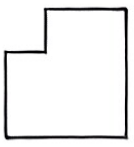
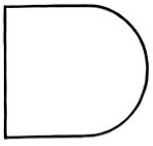
A. 20°.
B. 30°.
C. 40°.
D. 45°.



14. Which of the following may **NOT** have a right angle?

A. square
B. rectangle
C. parallelogram
D. right-angled triangle

15. Which of the following is a convex polygon?

A. 
B. 
C. 
D. 

16. Which of the following must be a regular polygon?

A. A triangle with three equal sides

B. A quadrilateral with four right angles

C. A pentagon with five equal angles

D. A hexagon with six equal sides

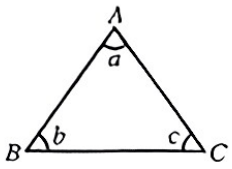
17. In the figure, which of the following angles is different from the others?

A. $\angle ABC$

B. $\angle CBA$

C. a

D. b



18. In $\triangle ABC$, if $\angle A$ is an obtuse angle, then $\angle B + \angle C$

A. must be a right angle.

B. must be an acute angle.

C. must be an obtuse angle.

D. must be a reflex angle.

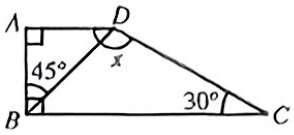
19. In the figure, $x =$

A. 105°.

B. 120°.

C. 135°.

D. 150°.



Make Yourself Smarter

In the figure, $ADCF$ is a straight line. Find $a + b + e + f$.