Name: _____ **Date:**_____

1. Listening:

A plane (1) figure, formed by closed chain of segments, is called a ***polygon***. Depending on a quantity of (2) angles a polygon can be a *triangle*, a *quadrangle*, a *pentagon*, an *hexagon* etc. The main elements of the polygons are *vertices of polygon, angles of polygon, diagonals* and (3) *sides of polygon.* A sum of all sides' lengths is called a *perimeter of polygon* and signed as *p.* If all diagonals lie inside of a polygon, it is called a *convex polygon*. A (4) sum of interior angles in any convex polygon is equal to $180 \cdot (n - 2)$ degrees, where n is a number of angles (or sides) of a polygon.

Triangle is a polygon with three sides. If all the three angles are acute, then this triangle is an *acute-angled triangle*; if one of the angles is right, then this triangle is a *right-angled triangle*; sides *a, b*, forming a right angle, are called (5) *legs*; side *c*, opposite to a right angle, called a *hypotenuse*; if one of the angles is obtuse, then this triangle is an *obtuse-angled triangle.*

A triangle ABC is an *isosceles triangle* if the *two* of its sides are equal; these equal sides are called *lateral* sides, the third side is called a *base* of triangle. A triangle ABC is an *equilateral triangle* if *all* of its sides are equal ($a = b = c$). In general case ($a \neq b \neq c$) we have a (6) *scalene triangle.*

Pythagorean Theorem: In a right-angled triangle a square of the (7) hypotenuse length is equal to a sum of squares of legs lengths.

Parallelogram is a quadrangle, opposite sides of which are two-by-two parallel. The main types of parallelograms are: (8) ***square*** (a parallelogram with right angles and equal sides), ***rectangle*** (a parallelogram with right angles and two-by-two equal side), ***rhombus*** (all sides of parallelogram are equal but the angles are not right).

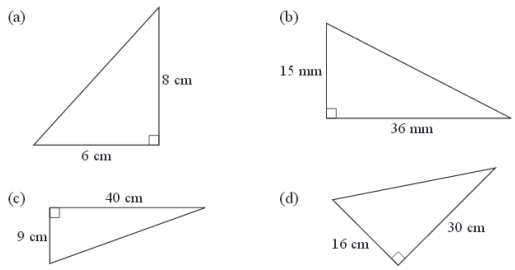
Trapeze is a quadrangle, two (9) opposite sides of which are parallel.

Trapezoid is a quadrangle without (10) parallel sides.

2. Calculate the length of the hypotenuse of a triangle in which the other two sides are of lengths 15 m and 20 m.

3. Calculate the length of the diagonals of a rectangle in which the sides are of lengths 10 m and 24 m.

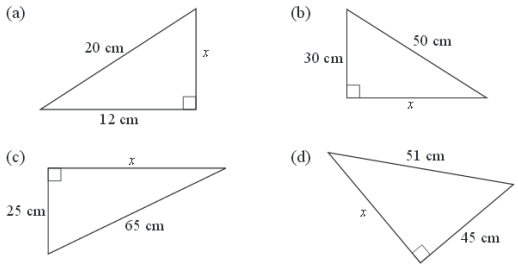
4. Calculate the length of the hypotenuse of each of these triangles:



5. A rectangle has sides of lengths 24 cm and 70 cm. How long is the diagonal of the rectangle?

6. An isosceles triangle has a base of length 10 cm and perpendicular height 12 cm. Calculate the length, x cm, of one of the equal sides and the perimeter of the triangle.

7. Calculate the length of the side marked x in each of the followina triangles



8. Calculate the perpendicular height of the isosceles triangle if the two equal sides measure 8 cm and the base 6 cm, giving your answer correct to 1 decimal place.

Answer the following problems. Feel free to draw a sketch to help you answer the question.

9. A rectangle measures 25 cm by 10 cm. What is its area?
10. The length of a rectangle is 12 cm and the area is 96 cm^2. What is the width?
11. I need to buy a carpet for a room that measures 3 m by 2 m. How many square meters do I need?
12. The diameter of a circle is 3 cm. What is the circumference?
13. A painting measures 40 cm by 35cm. How many squared cm does its surface cover?
14. The circumference of a circle is 15.7 cm. What is the diameter?
15. One side of a square measures 15cm. What is its area?
16. If the area of a rectangle is 60 cm^2 and its width is 6 cm. What is its length?
17. The area of a square is 81 cm^2. What is the length of one of its sides?
18. The area of a circle is 201 cm^2. What is the diameter?
19. A game card is 10 cm by 5 cm. What is its perimeter?
20. A triangular-shaped yard has a base of 25 meters and a height of 12 meters. What is its area?
21. A trapeze has bases of 9 in and 7 in and a height of 5 in. What is its area?
22. A large window has a length of 8 feet and a width of 6 feet. What is its area?
23. The perimeter of a square is 220 cm. What is the length of each side?
24. If one side of a stop sign measures 12 inches, then what is its perimeter?
25. A trapezoid has bases of 7 centimetres and 5 centimetres and a height of 3 centimetres. What is its area?
26. A rectangular piece of paper has a width of 16 inches and an area of 192 in^2. What is its length?
27. A square garden has a side of 22 m. How many meters of fence are needed to enclose the garden?
28. A chessboard has an area of 100 square inches. What is its perimeter?