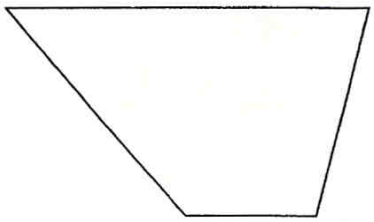
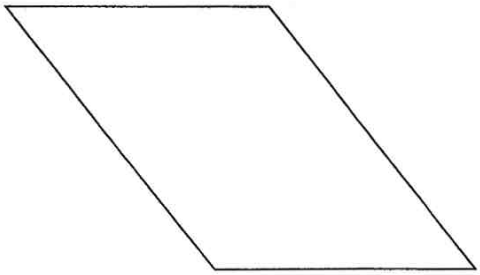
6-4 Properties of Quadrilaterals

6-4 *PROPERTIES OF QUADRILATERALS*

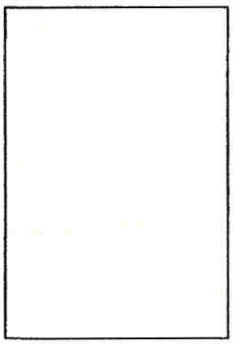
Measure the appropriate angles and lengths of each quadrilateral to complete the table below.
Put a check in the column if the quadrilateral has that property.



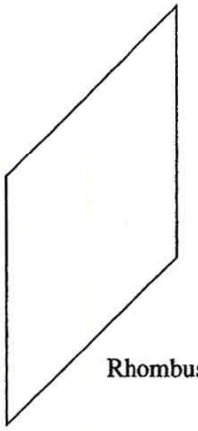
Trapezoid



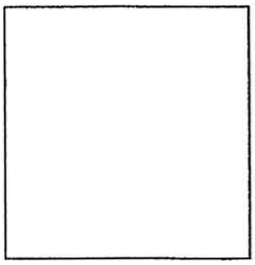
Parallelogram



Rectangle



Rhombus



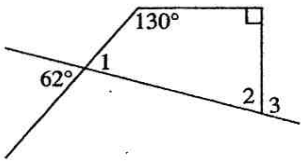
Square

Property	Trapezoid	Parallelogram	Rhombus	Rectangle	Square
Opposite sides are parallel.					
Opposite sides are congruent.					
All sides are congruent.					
Opposite angles are congruent.					
All angles are right angles.					
Consecutive angles are supplementary.					
Diagonals are congruent.					
Diagonals bisect each other.					
Diagonals are perpendicular.					
Each diagonal bisects two angles.					

QUADRILATERALS

Complete each of the following questions by naming quadrilaterals and segments and calculating angles and lengths.

1.

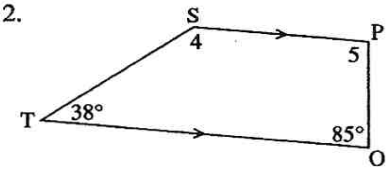


$\angle 1 =$ _____

$\angle 2 =$ _____

$\angle 3 =$ _____

2.



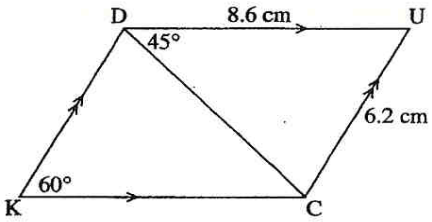
$\angle 4 =$ _____

$\angle 5 =$ _____

SP || _____

SPOT is a _____

3.



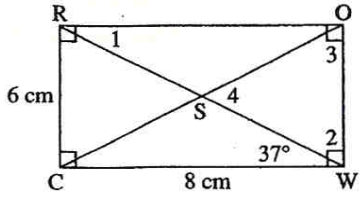
DUCK is a _____

DK || _____ $\angle DUC =$ _____

KC = _____ cm $\angle DCK =$ _____

DK = _____ cm $\angle KCU =$ _____

4.



CROW is a _____

ΔCRW is a(n) _____ Δ

ΔSOW is a(n) _____ Δ

ΔSOR is a(n) _____ Δ

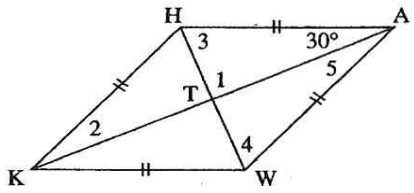
RW = _____ cm $\angle 1 =$ _____

CO = _____ cm $\angle 2 =$ _____

CS = _____ cm $\angle 3 =$ _____

$\angle 4 =$ _____

5.



HAWK is a _____

ΔHAK is a(n) _____ Δ

ΔHAW is a(n) _____ Δ

ΔHAT is a(n) _____ Δ

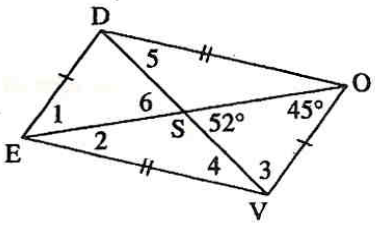
$\angle 1 =$ _____ $\angle 5 =$ _____

$\angle 2 =$ _____ $\angle HAW =$ _____

$\angle 3 =$ _____ $\angle AWK =$ _____

$\angle 4 =$ _____

6.



∠ODE = 110°
DV = 6.18 cm
ES = 2.6 cm

DOVE is a _____

DS = _____ cm ∠2 = _____

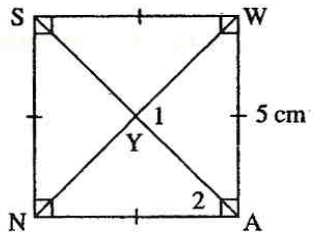
EO = _____ cm ∠3 = _____

∠EVO = _____ ∠4 = _____

∠DEV = _____ ∠5 = _____

∠1 = _____ ∠6 = _____

7.



SWAN is a _____

WN = _____ cm

SA = _____ cm ∠1 = _____

SY = _____ cm ∠2 = _____

8. Answer the following questions True or False. If false, explain your reasoning.

a) All rectangles are squares _____

b) All squares are rectangles _____

c) If a quadrilateral has 4 equal sides then it is a square _____

d) If the opposite sides of a quadrilateral are equal it must be a rectangle _____

e) If a quadrilateral has diagonals that bisect each other, it must be either a square or a rhombus _____

f) If the angles in a polygon add up to 360°, then it must have four sides _____

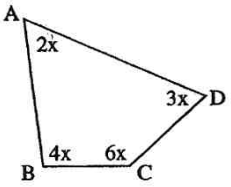
g) If the opposite sides of a quadrilateral are equal and parallel, it cannot be a trapezoid _____

6-5 Problems

7 -11 are challenge/extra questions

6-5 *PROBLEMS*

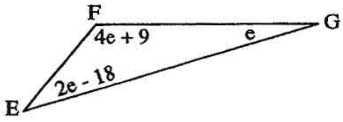
1.



x = _____

∠C = _____

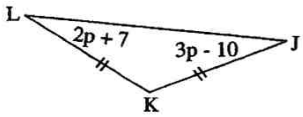
2.



e = _____

∠E = _____

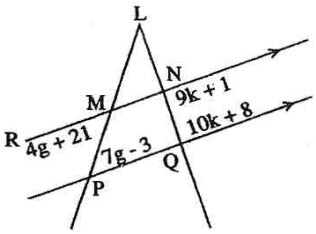
3.



p = _____

∠K = _____

4.



g = _____

k = _____

∠PMR = _____

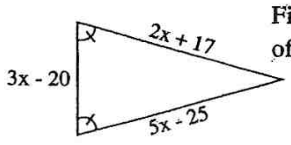
∠LMN = _____

∠QNM = _____

∠MNL = _____

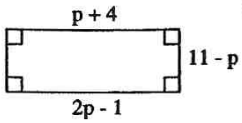
∠MLN = _____

5.



Find x and and the perimeter of the triangle.

6.



Find p and the area of the rectangle.

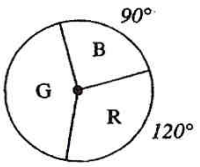
7. The coordinates (–5, 4), (1, 4), and (–5, –2) are three of the vertices of a rectangle. Find the coordinates of the fourth vertex.

8. Coordinates (–4, 0) and (2, 2) are two vertices of an isosceles triangle. Which of the following points could be the third vertex: (2, –2), (8, 0), (4, –4)?

9. (–4, –1), (–2, 2), and (2, –1) are three vertices of a parallelogram. Find all possible coordinates for the fourth vertex.

10. Find the area of the triangle with vertices (0, –2), (2, 4), and (8, –2).

11.

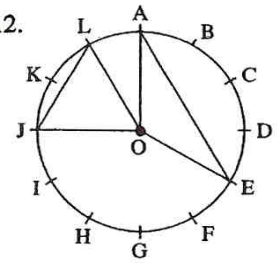


$\frac{1}{4}$ of a circle is blue, $\frac{1}{3}$ is red, and the rest is green.

a) How many degrees is the angle at the centre of the green sector?

b) If the radius of the circle is12cm, how long is the curved edge of the red sector?

12.



∠AOE = _____

∠OAE = _____

∠JOL = _____

∠OLJ = _____

13. The ratio of angles in a triangle is 1:5:6. Find the measure of each angle.

14. Angle A is twice as big as Angle B, and Angle C is 30° more than seven times Angle B. If these three angles are in the same triangle, find the measure of each angle.

15. The ratio of angles in a quadrilateral is 1:4:5:8.
a) Find the measure of each angle.

b) What special quadrilateral could this be? Justify your answer.

16. The three angles in an isosceles triangle are such that the smallest angle is half of each of the two larger angles. Find the measure of each angle.

17. An angle of "$5x + 25$" degrees is co-interior with an angle of "$8x - 27$" degrees. Find x, then give the measure of each angle.

18. If $5x + 5, 7x - 9, \text{ and } 10x + 30$ are the measures of three angles in a triangle, what type of triangle must it be? Justify your answer.