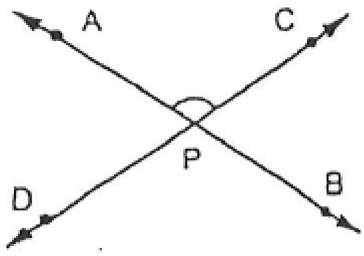
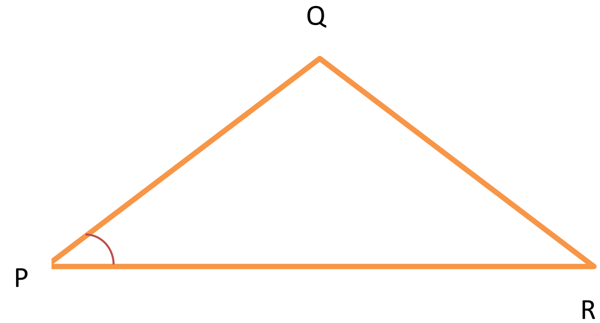
Unit 6 Geometry Package

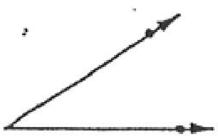
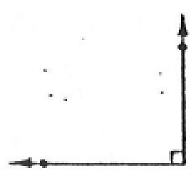
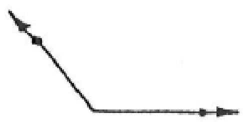
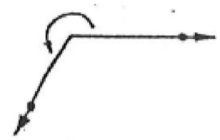
MPM1D

The basic elements of any geometric figure are points and lines. When lines intersect at a point, angles are formed.

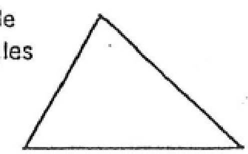
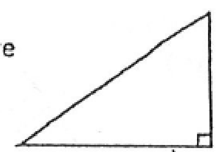
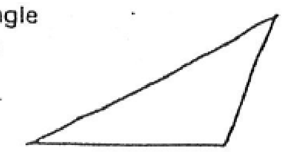




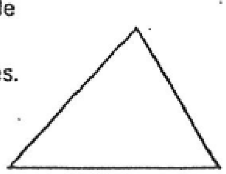
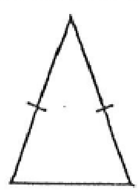
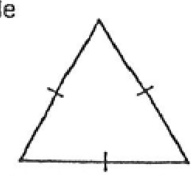
Angles can be classified according to their measures in degrees.

Acute angle	Right angle	Obtuse angle	Straight angle	Reflex angle
Angle measure is less than 90°. 	Angle measure is 90°. 	Angle measure is greater than 90° but less than 180°. 	Angle measure is 180°. 	Angle measure is greater than 180°. 

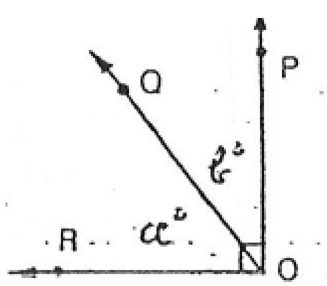
Triangles can be classified according to the measure of their angles.

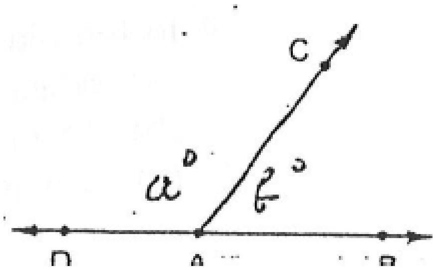
Acute triangle	Right triangle	Obtuse triangle
All three angles are acute. 	One angle measure is 90°. 	One angle is obtuse. 

Triangles can also be classified according to the measures of their sides.

Scalene triangle	Isosceles triangle	Equilateral triangle
No sides have equal measures. 	Two sides have equal measures. 	Three sides have equal measures. 

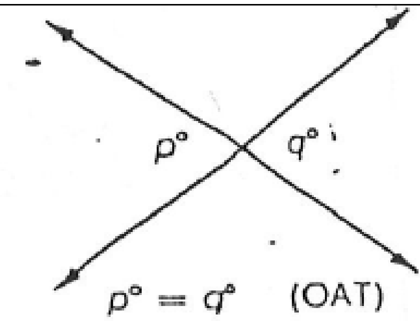
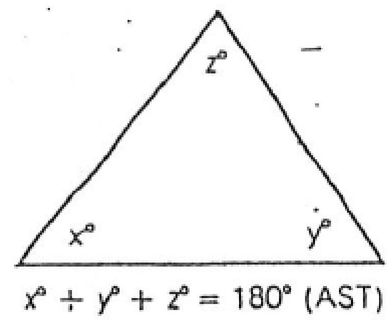
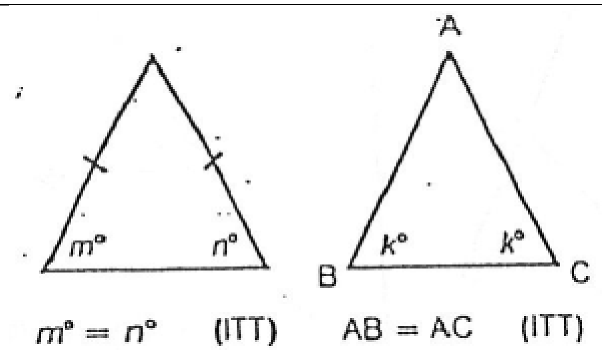
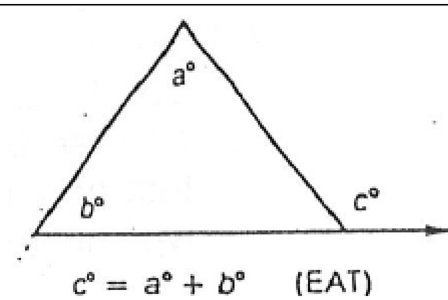
Two angles whose measures add to 90° are called ***complementary***. Two angles whose measures add to 180° are called ***supplementary***.





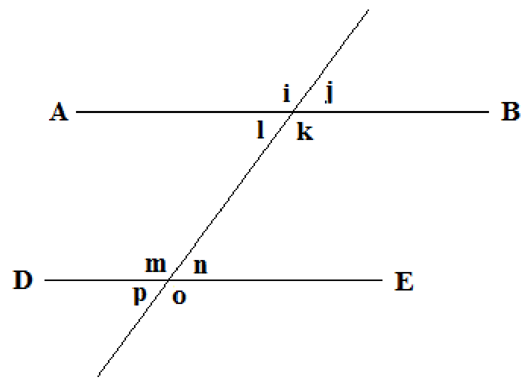
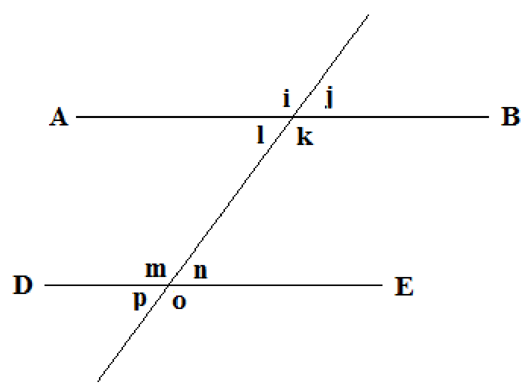
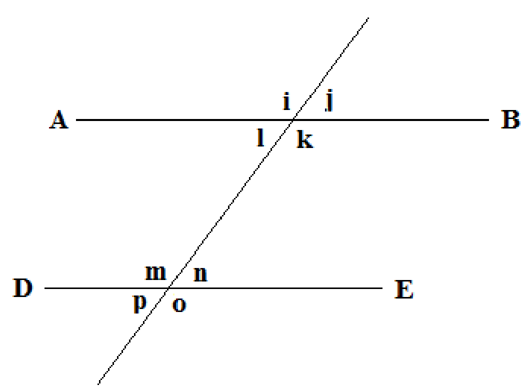
Theorems in Euclidean Geometry

The following is a list of "theorems" (rules) explored long ago by a Greek mathematician named Euclid.

Theorem		
Opposite Angle Theorem (OAT)	When two lines intersect the opposite angles formed are equal to each other.	
Angle Sum of a Triangle (AST)	In any triangle, the sum of all 3 *interior angles* is equal to 180°	
Isosceles Triangle Theorem (ITT)	In an isosceles triangle the two angles at the base of the equal sides are equal. Conversely, if two angles in a triangle are equal, the triangle is isosceles.	
Exterior Angle of a Triangle Theorem (EATT)	In any triangle, the measure of an *exterior angle* is equal to the sum of the measures of the opposite two interior angles.	

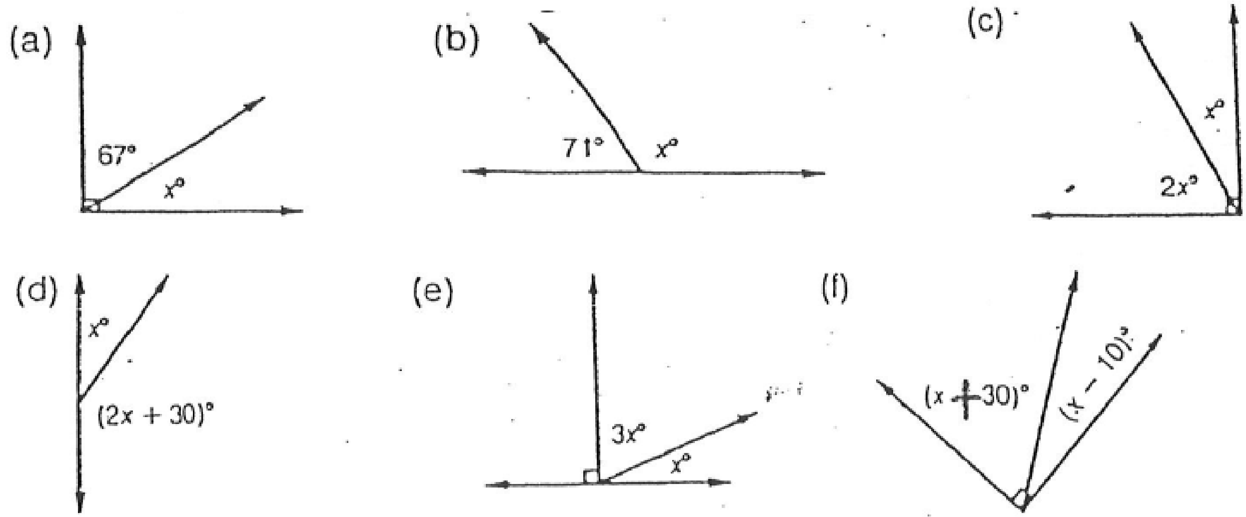
Parallel Line Theorems

A line that intersects two parallel lines is called a transversal. A transversal creates 8 angles. These angles have the following patterns.

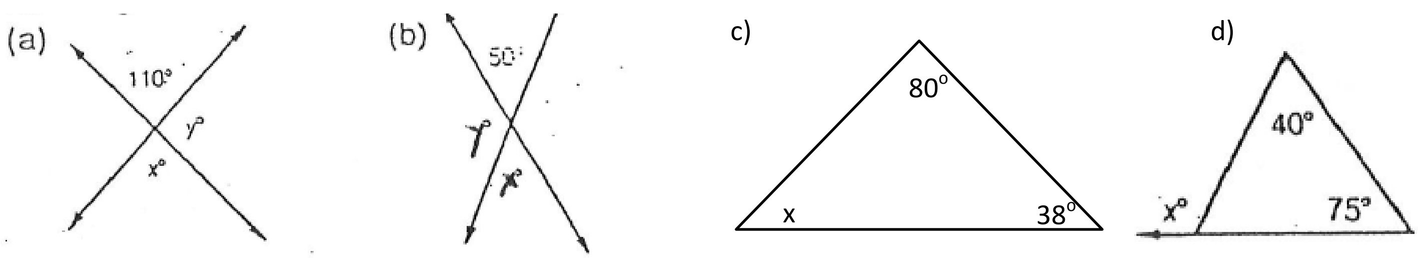
Alternate Angles **Z-Pattern** **(PLT – Z)**	
Corresponding Angles **F-Pattern** **(PLT-F)**	
Interior Angles **C-Pattern** **(PLT-C)**	

Problems

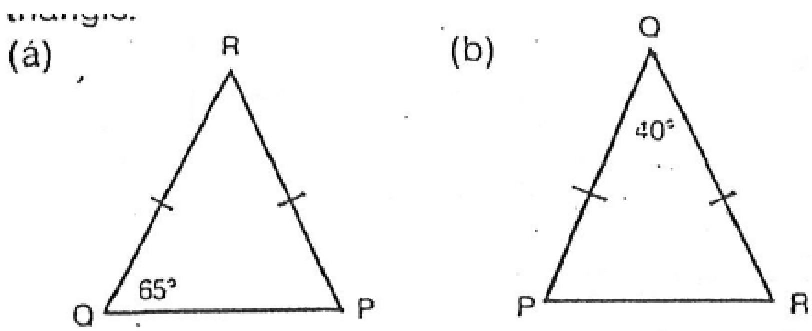
1. Find the value of x in each diagram.



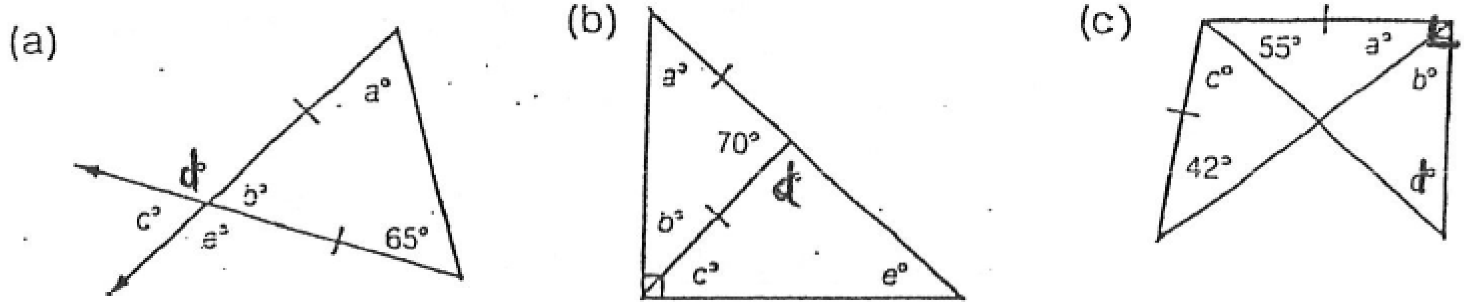
2. Find measures in each of the following. (Be sure to give reasons for your answers)



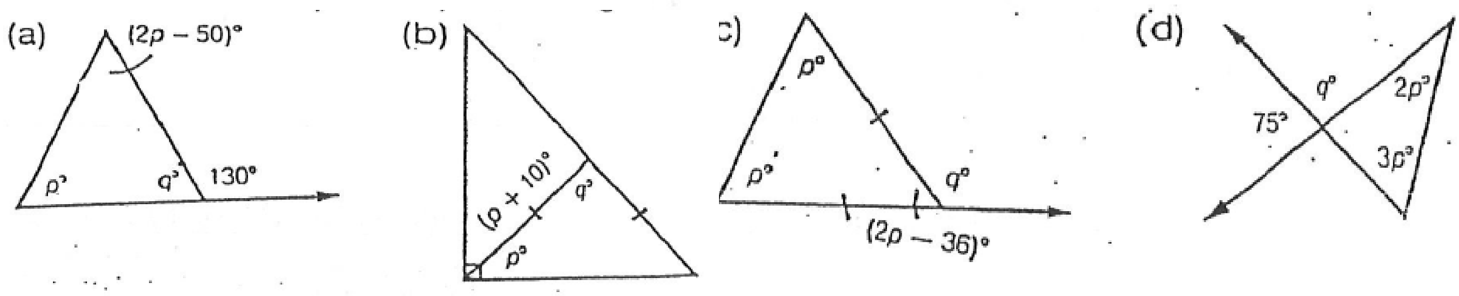
3. Find the measures of angles <QPR and <QRP in each diagram below.



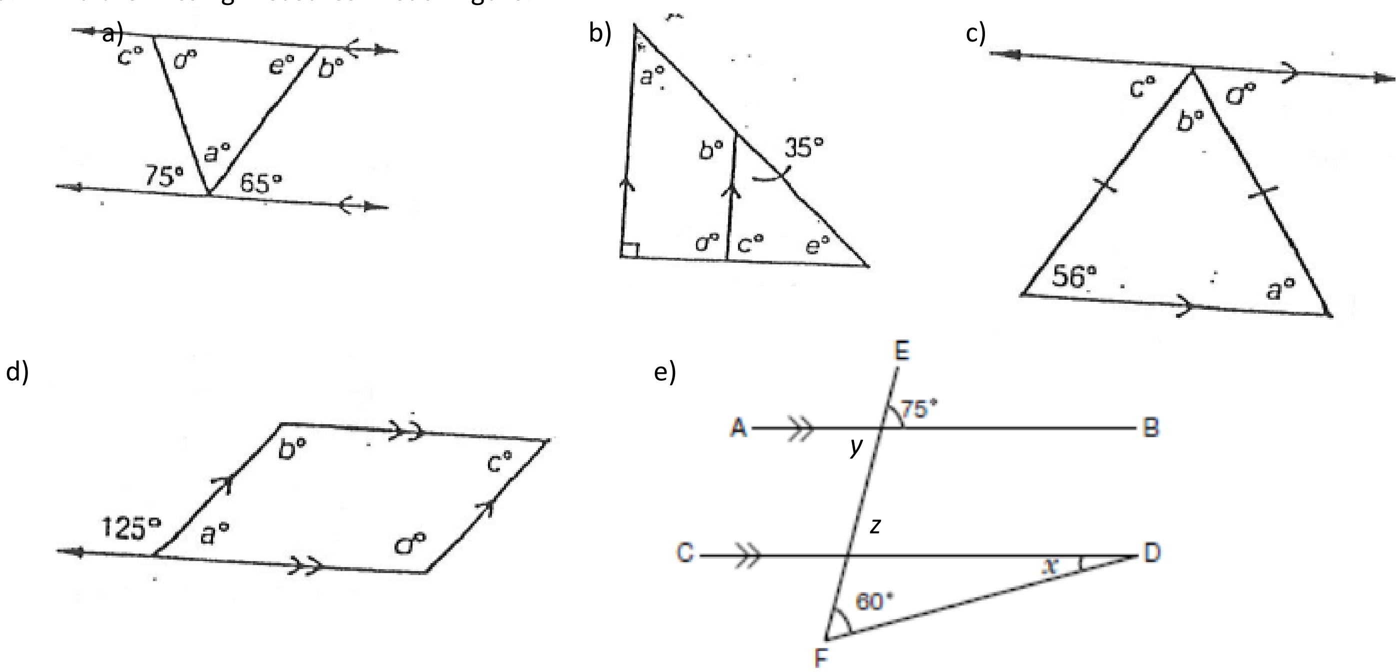
4. Find the missing measures. Give reasons.



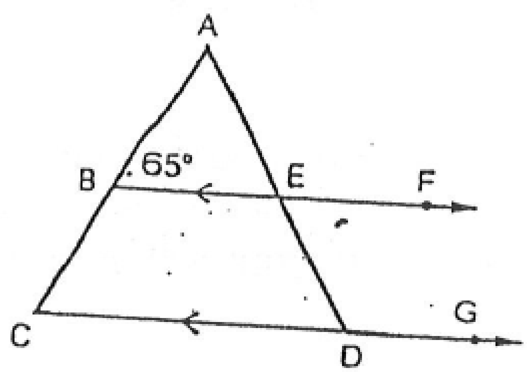
5. Find the measures of p and q in each figure below.



6. Find the missing measures in each figure.



7. Find the measures of all missing angles in the diagram below. Give reasons.



Final Answers

1. a) 23° b) 109° c) 30° d)50° e) 22.5° f) 35° **2**. a) x=110, y= 70 b)x= 50, y = 130 c) x = 62 d) x=115 **3**. a) 65°, 50° b) 70°, 70° **4.** a) a = 65, b=50, c= 50 , d= 130, e = 130 b) a= 55, b = 55, c = 35, d = 110, e = 35 c) a = 42, b = 48, c = 41, d = 35 **5**. a) p = 60, q = 50 b) p = 40, q = 100 c) p = 54, q = 108 d) p = 21, q = 105 **6.** a) a = 40, b = 115, c = 105, d = 75, e = 65 b) a = 35, b = 145, c = 90, d = 90, e = 55 c) a = 56, b = 68, c = 56, d = 56 d) a = 55, b= 125, c=55, d = 125 e) y = 75, z = 75, x = 15 **7.** <AEB = 65°, <ACD = 65°, <ADC = 65°, <BAE = 50°, <AEF = 115°, <ADG = 115°, <CBE = 115°, <BED =115°, <FED = 65°,