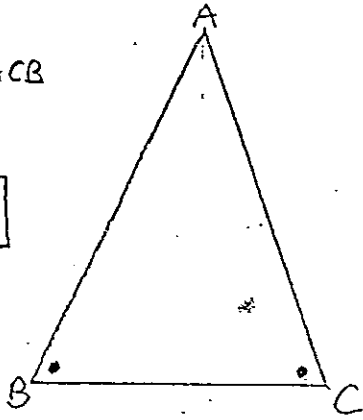


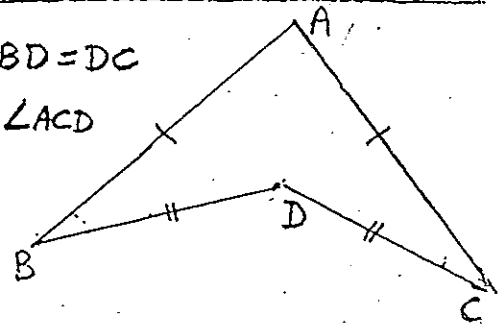
GEOMETRY WORKSHEET 1.

① Given $\angle ABC = \angle ACB$
 Prove $AB = AC$

[HINT: Construct
 $AD \perp BC$]

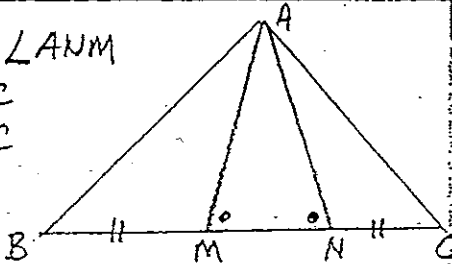


② $AC = AB$ & $BD = DC$
 Prove $\angle ABD = \angle ACD$



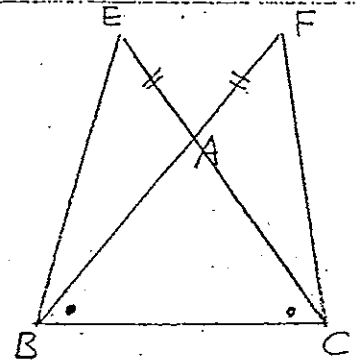
③ Given $\angle AMN = \angle ANM$
 and $BM = NC$
 Prove $AB = AC$

[HINT: Show
 $\triangle ABM \cong \triangle ACN$]



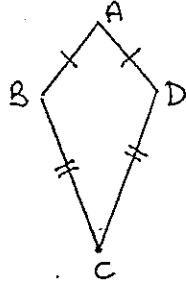
④ $\angle ABC = \angle ACB$
 $\angle EA = FA$
 Prove $EB = FC$

[HINT: Show
 $\triangle EBA \cong \triangle FAC$]

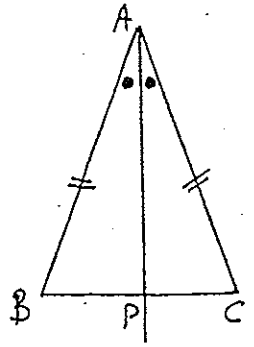


CONGRUENCY PROOFS 2.

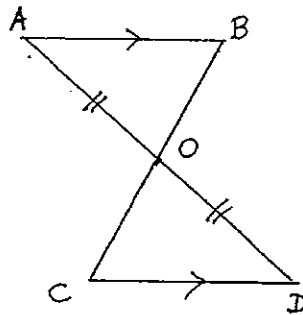
① ABCD is a "kite"
with $AB=AD$ & $BC=DC$
Prove using congruent Δ 's
that $\angle ABC = \angle ADC$



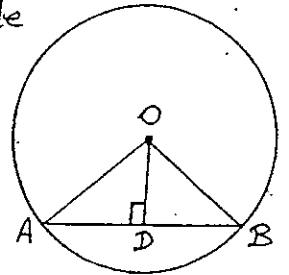
② Given $AB=AC$
and AP bisects $\angle BAC$
Prove using congruent Δ 's
(i) $\angle ABC = \angle ACB$ (base \angle 's equal)
(ii) $AP \perp BC$



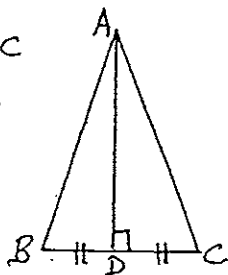
③ Prove $\triangle ABO \equiv \triangle COD$
Hence prove $BO=CO$



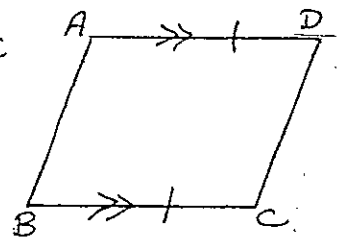
④ O is the centre of the circle
and $OD \perp AB$
Prove $\triangle ODA \equiv \triangle ODB$
Hence prove D is the
mid-point of AB.



⑤ Given $BD=DC$, $AD \perp BC$
Prove $\triangle ABC$ is isosceles



⑥ Given $AD=BC$ & $AD \parallel BC$
Prove that $AB \parallel CD$.



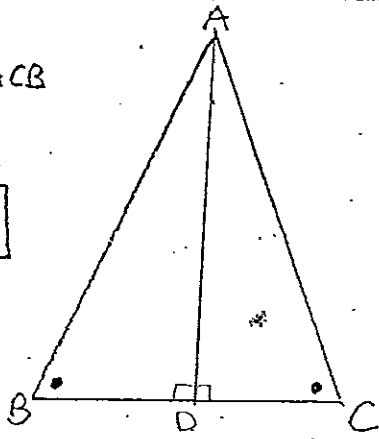
GEOMETRY WORKSHEET



Given $\angle ABC = \angle ACB$

Prove $AB = AC$

[HINT: Construct $AD \perp BC$]



In $\triangle ABD$ & $\triangle ACD$

$\angle ABD = \angle ACD$ (given) ✓

$\angle ADB = \angle ADC$ (perpendicular) ✓

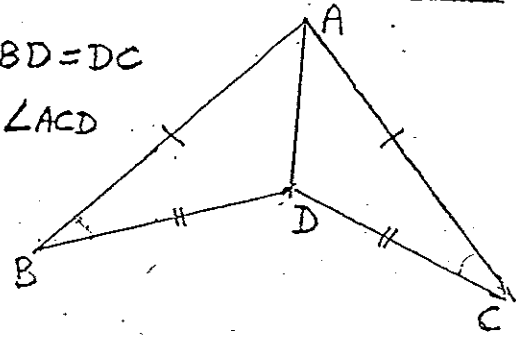
AD is common ✓

$\therefore \triangle ABD \cong \triangle ACD$ (AAS) ✓

$\therefore AB = AC$ ✓

② $AC = AB$ & $BD = DC$

Prove $\angle ABD = \angle ACD$



In $\triangle ABD$ & $\triangle ACD$ =

$AB = AC$ (given) ✓

$BD = DC$ (given) ✓

AD is common ✓

$\therefore \triangle ABD \cong \triangle ACD$ (SSS) ✓

$\therefore \angle ABD = \angle ACD$ (matching angles) ✓

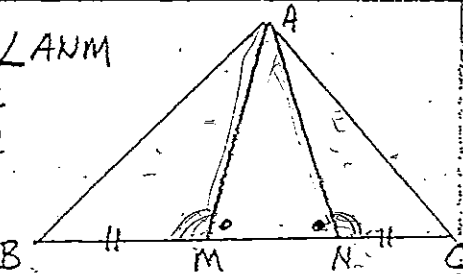
③ Given $\angle AMN = \angle ANM$

and $BM = NC$

Prove $AB = AC$

[HINT: Show

$\triangle ABM \cong \triangle ACN$]



In $\triangle ABM$ & $\triangle ACN$ ✓

$BM = NC$ (given) ✓

$\angle BMA = \angle ANC$ (supplementary) ✓

$AM = AN$ (isosceles triangle $\triangle AMN$) ✓

$\therefore \triangle ABM \cong \triangle ACN$ (SAS) ✓

$\therefore AB = AC$ (matching sides) ✓

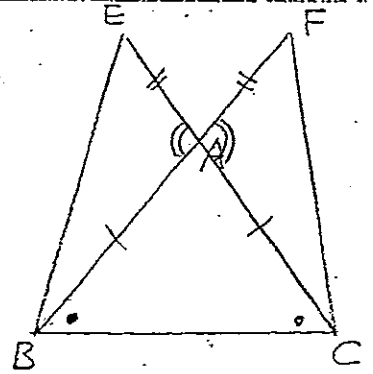
④ $\angle ABC = \angle ACB$

& $EA = FA$

Prove $EB = FC$

[HINT: Show

$\triangle EBA \cong \triangle FAC$]



In $\triangle EBA$ & $\triangle FAC$ ✓

$EA = FA$ (given) ✓

$\angle EAB = \angle FAC$ (vertically opp.) ✓

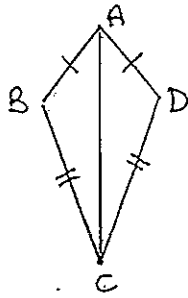
$AB = AC$ (isosceles triangle $\triangle ABC$) ✓

$\therefore \triangle EBA \cong \triangle FAC$ (SAS) ✓

$\therefore EB = FC$ (matching sides) ✓

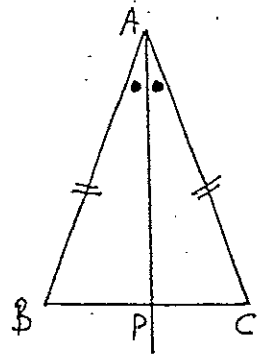
CONGRUENCY PROOFS 2.

1) ABCD is a "kite" with $AB=AD$ & $BC=DC$
 Prove using congruent Δ 's that $\angle ABC = \angle ADC$



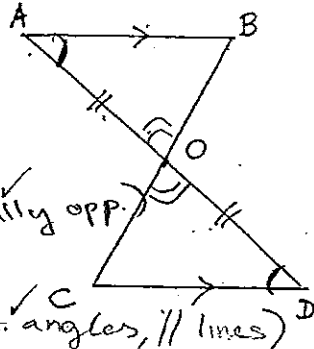
In ΔABC & ΔADC ✓
 $AB=AD$ (given) ✓
 $BC=DC$ (given) ✓
 AC is common ✓
 $\therefore \Delta ABC \cong \Delta ADC$ (SSS) ✓
 $\therefore \angle ABC = \angle ADC$ (matching angles) ✓

2) Given $AB=AC$ and AP bisects $\angle BAC$
 Prove using congruent Δ 's
 (i) $\angle ABC = \angle ACB$ (base \angle 's equal)
 (ii) $AP \perp BC$



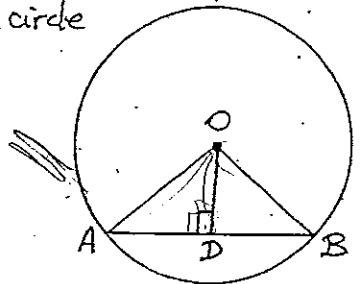
In ΔABP & ΔACP
 $AB=AC$ (given) ✓
 $\angle BAP = \angle CAP$ (given) ✓
 AP is common ✓
 $\therefore \Delta ABP \cong \Delta ACP$ (SAS) ✓
 $\therefore \angle ABC = \angle ACB$ (matching angles) ✓
 $\therefore \angle BPA = \angle CPA$ (matching angles) ✓
 $\therefore \angle BPA + \angle CPA = 180^\circ$ (straight angle) ✓
 $\therefore \angle BPA = 90^\circ \therefore AP \perp BC$ ✓

3) Prove $\Delta ABO \cong \Delta COD$
 Hence prove $BO=CO$



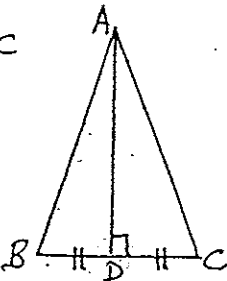
In ΔABO & ΔCOD
 $\angle AOB = \angle COD$ (vertically opp.) ✓
 $AO=OD$ (given) ✓
 $\angle BAD = \angle ADC$ (alt. angles, \parallel lines) ✓
 $\therefore \Delta ABO \cong \Delta COD$ (AAS) ✓
 $\therefore BO=CO$ (matching sides) ✓

4) O is the centre of the circle and $OD \perp AB$
 Prove $\Delta ODA \cong \Delta ODB$
 Hence prove D is the mid-point of AB.



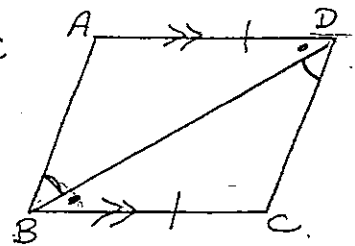
In ΔODA & ΔODB
 $OA=OB$ (radii) ✓
 OD is common ✓
 $\angle ODA = \angle ODB$ (given) ✓
 $\therefore \Delta ODA \cong \Delta ODB$ (RHS) ✓
 $\therefore AD=BD$ (matching sides) ✓

5) Given $BD=DC$, $AD \perp BC$
 Prove ΔABC is isosceles



In ΔABD & ΔACD
 $BD=DC$ (given) ✓
 $\angle ADC = \angle ADB$ (given) ✓
 AD is common ✓
 $\therefore \Delta ABD \cong \Delta ACD$ (SAS) ✓
 $AB=AC$ (matching sides) ✓
 $\angle ABD = \angle ACD$ (matching angles) ✓
 $\therefore \Delta ABC$ is isosceles ✓

6) Given $AD=BC$ & $AD \parallel BC$
 Prove that $AB \parallel CD$.



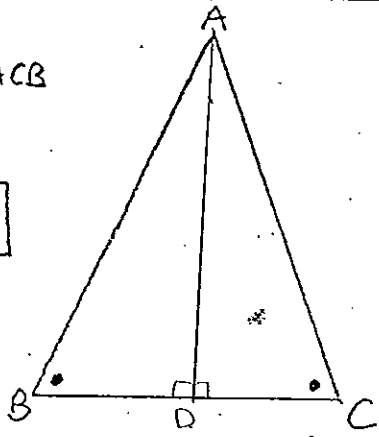
In ΔADB & ΔDBC
 $AD=BC$ (given) ✓
 $\angle ADB = \angle DBC$ (alt angles) ✓
 DB is common ✓
 $\therefore \Delta ADB \cong \Delta DBC$ (SAS) ✓
 $\angle CAB = \angle ABD$ (matching angles) ✓
 $\therefore AB \parallel CD$ (Alternate \angle 's are equal)

GEOMETRY WORKSHEET



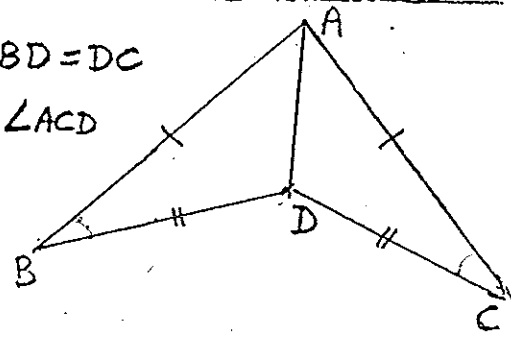
1) Given $\angle ABC = \angle ACB$
 Prove $AB = AC$

[HINT: Construct $AD \perp BC$]



In $\triangle ABD$ & $\triangle ACD$
 $\angle ABD = \angle ACD$ (given) ✓
 $\angle ADB = \angle ADC$ (perpendicular) ✓
 AD is common ✓
 $\therefore \triangle ABD \cong \triangle ACD$ (AAS) ✓
 $\therefore AB = AC$ ✓

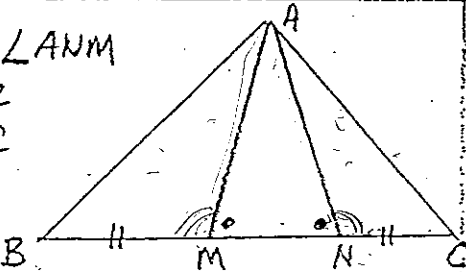
2) $AC = AB$ & $BD = DC$
 Prove $\angle ABD = \angle ACD$



In $\triangle ABD$ & $\triangle ADC$ =
 $AB = AC$ (given) ✓
 $BD = DC$ (given) ✓
 AD is common ✓
 $\therefore \triangle ABD \cong \triangle ADC$ (SSS) ✓
 $\therefore \angle ABD = \angle ACD$ (matching angles) ✓

3) Given $\angle AMN = \angle ANM$
 and $BM = NC$
 Prove $AB = AC$

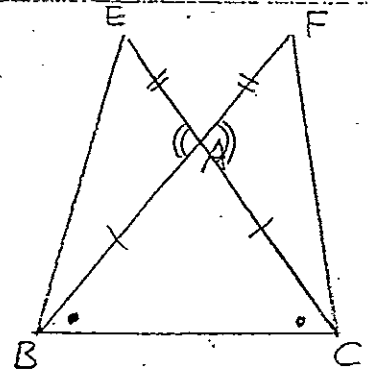
[HINT: Show $\triangle ABM \cong \triangle ACN$]



In $\triangle ABM$ & $\triangle ACN$ ✓
 $BM = NC$ (given) ✓
 $\angle BMA = \angle ANC$ (supplementary) ✓
 $AM = AN$ (isosceles triangle) ✓
 $\therefore \triangle ABM \cong \triangle ACN$ (SAS) ✓
 $\therefore AB = AC$ (matching sides) ✓

4) $\angle ABC = \angle ACB$
 & $EA = FA$
 Prove $EB = FC$

[HINT: Show $\triangle EBA \cong \triangle FAC$]



In $\triangle EBA$ & $\triangle FAC$ ✓
 $EA = FA$ (given) ✓
 $\angle EAB = \angle FAC$ (vertically opp.) ✓
 $AB = AC$ (isosceles triangle ABC) ✓
 $\therefore \triangle EBA \cong \triangle FAC$ (SAS) ✓
 $\therefore EB = FC$ (matching sides) ✓