## Ex:- 6.1

(1)

(i) All circles are similar.

(ii) All squares are similar.

(iii) All equilateral triangles are similar.

(iv) Two polygons of the same no. of sides are similar, if (a) their corresponding angles are equal and (b) their corresponding sides are proportional.

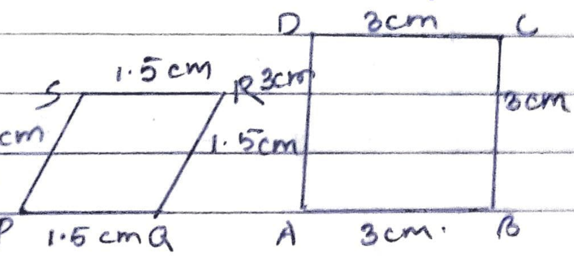
(2)

(i) Similar figures:- two circles with different radius.

(ii) Non-similar figures:- a rhombus and a square.

(3)

(i) They are non-similar figures as their angles are not equal.




## Ex:-6.2

(1) $\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{1.5}{3} = \frac{1}{EC}$

$1.5\,EC = 3$

$EC = \frac{3}{1.5}$

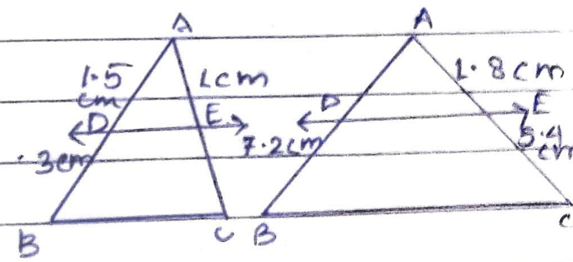
$\boxed{EC = 2\,cm}$

$\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{AD}{7.2} = \frac{1.8}{5.4}$

$\frac{AD}{7.2} = \cancel{\frac{1.8}{5.4}}\ \frac{1}{3}$

$\boxed{AD = 2.4\,cm}$



3. To prove:- $\frac{AM}{AB} = \frac{AN}{AD}$

In $\triangle ABC$, $LM \parallel CB$.

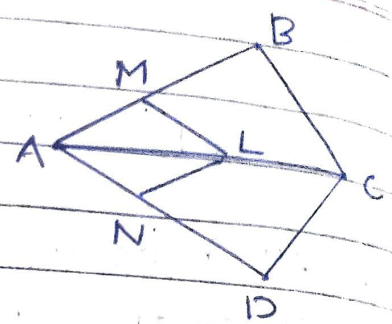
$\frac{AM}{AB} = \frac{AL}{LC}$ [By BPT] —(i)

In $\triangle ACD$, $LN \parallel CD$.

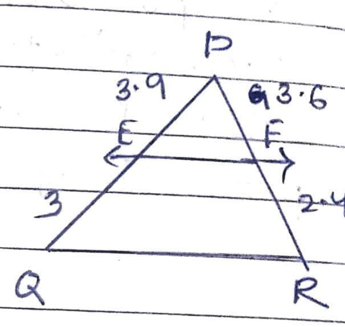
$\frac{AN}{AD} = \frac{AL}{AC}$ [By BPT] —(ii)

From (i) and (ii),

$\frac{AM}{AB} = \frac{AN}{AD}$ [∴ Hence proved]




(2) (i). $\frac{PE}{EQ} = \frac{PF}{FR}$




$\frac{3\cdot9}{3} = \frac{3\cdot6}{2\cdot4}$

$\frac{\cancel{39}^{13}}{\cancel{3}\times10} = \frac{\cancel{36}\times1\cancel{0}}{\cancel{24}\times1\cancel{0}}$

$\frac{13}{10} \neq \frac{3}{2}$.

$1\cdot3 \neq 1\cdot5$

∴ EF is not $\parallel$ to QR.

(ii) $\frac{4}{4\cdot5} = \frac{8}{9}$

$= \frac{4\times1\cancel{0}^{2}}{\cancel{45}_{9}} = \frac{8}{9}$

$= \frac{8}{9} = \frac{8}{9}$

∴ $EF \parallel QR$.

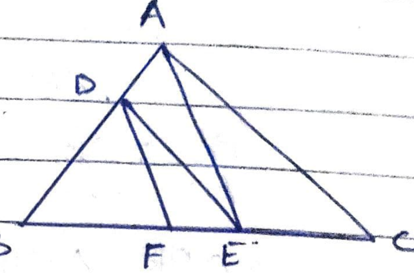
(iii) $\frac{0\cdot18}{1\cdot1} = \frac{0\cdot36}{2\cdot2}$

$= \frac{9\,\cancel{18}\times1\cancel{0}}{11\times\cancel{100}_{5}} = \frac{\cancel{36}\times1\cancel{0}}{\cancel{22}\times\cancel{100}}$

$= \frac{\cdot9}{55} = \frac{9}{55}$

∴ $EF \parallel QR$.

(4) Given:- DE ∥ AC and DF ∥ AE




To prove:- $\frac{BF}{FE} = \frac{BE}{EC}$

In △ABC, DE ∥ AC.

$\frac{AD}{DB} = \frac{CE}{BE}$ [By BPT] —(1)

In △ABE,

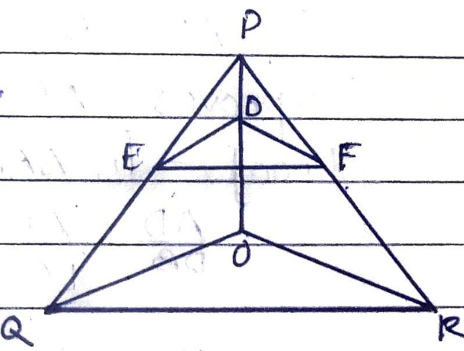
$\frac{AD}{DB} = \frac{EF}{FB}$ [By BPT] —(11)

From (1) and (11).

$\frac{CE}{BE} = \frac{EF}{FB}$

$\frac{BF}{FE} = \frac{BE}{EC}$ [Hence proved].

(5) Given:- DE ∥ OQ and DF ∥ OR.




To prove:- EF ∥ QR

Proof:- In △PQO, DE ∥ OQ.

$\frac{PE}{EQ} = \frac{PD}{DO}$ [By BPT] —(1)

In △PRO.

$\frac{PF}{FR} = \frac{PD}{DO}$ [By BPT] —(11)

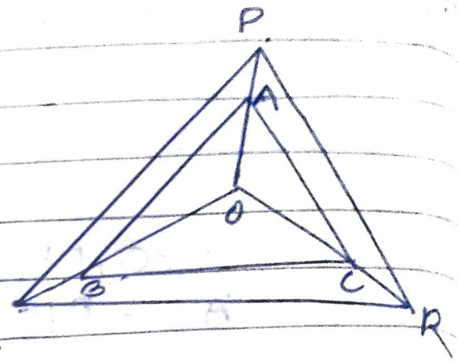
From (1) and (11),

$\frac{PE}{EQ} = \frac{PF}{FR}$.

So, EF ∥ QR [∴ Hence proved]

(6) Given :- $AB \parallel PQ$ and $AC \parallel PR$.

To prove :- $BC \parallel QR$.




Proof :- In $\triangle OPQ$, $AB \parallel PQ$.

$$\frac{PA}{AO} = \frac{QB}{BO} \text{ [By BPT]} - (1)$$

In $\triangle OPR$, $AC \parallel PR$

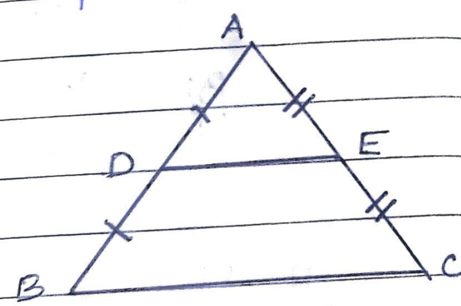
$$\frac{PA}{AO} = \frac{RC}{CO} \text{ [By BPT]} - (11)$$

From (1) and (11),

$$\frac{QB}{BO} = \frac{RC}{CO}$$

Therefore, $BC \parallel QR$ [$\therefore$ Hence proved]

(7) Given :- $\triangle ABC$, $DE \parallel BC$.
and DE is the mid point




so $AD = DB$.

To prove :- $AE = EC$

Proof :- In $\triangle ABC$, $DE \parallel BC$

$$\frac{AD}{DB} = \frac{AE}{EC} \text{ (By BPT)}$$

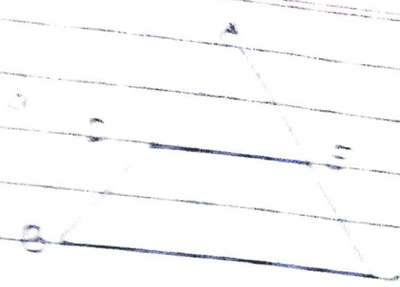
$$\frac{\cancel{AD}}{\cancel{AD}} = \frac{AE}{EC} \quad [AD = DB]$$

$$1 = \frac{AE}{EC}$$

$AE = EC$ [$\therefore$ Hence proved]

(8) Givens:– $\frac{AD}{DB} = \frac{AE}{EC}$

as D is the midpoint of AB and E is the midpoint of AC




To proves:– DE ∥ BC

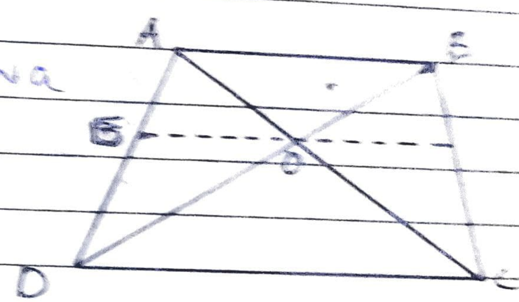
Proof:– In △ABC.

$\frac{AD}{DB} = \frac{AE}{EC}$ ~~By BPT~~ By Theorem 6.2

Therefore, DE ∥ BC [∴ Hence proved]

(9) Givens:– AB ∥ DC

To prove: $\frac{AO}{BO} = \frac{CO}{DO}$ | Construction:– Draw a line EO ∥ AB.




Proof:– In △ABD, EO ∥ AB

$\frac{AE}{ED} = \frac{BO}{DO}$ [By BPT] – (i)

In △ADC, AB ∥ DC.

$\frac{AE}{ED} = \frac{AO}{CO}$ [By BPT] – (ii)

From (i) and (ii),

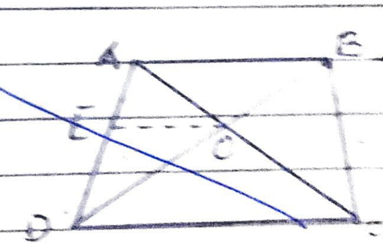
$\frac{AO}{CO} = \frac{BO}{DO}$

$\frac{AO}{BO} = \frac{CO}{DO}$ [∴ Hence proved]

(10) ~~Given:– $\frac{AO}{BO} = \frac{CO}{DO}$~~

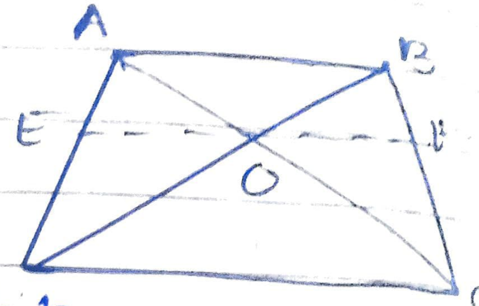
~~Cons:– EO ∥ AB~~

~~To proof:– In △ABD, EO ∥ AB,~~



From (1) and (11),

$\cancel{\frac{AO}{CO} = AB}$




)) **Given:-** $\frac{AO}{BO} = \frac{CO}{DO}$

**To prove:-** ABCD is a trapezium

**Cons:-** EF || AB passing through O.

**Proof:-** $\frac{AO}{CO} = \frac{BO}{DO}$ - (1)

Now, in $\triangle ADB$, $EO \parallel AB$ [$EF \parallel AB$]

$\frac{AE}{DE} = \frac{BO}{DO}$

$\frac{AE}{DE} = \frac{AO}{CO}$ $\left[\because \frac{AO}{CO} = \frac{BO}{DO} \text{ from } (1)\right]$

So in $\triangle ADC$,

$\therefore EO \parallel DC$.

Now, $EO \parallel DC$

we know, $EO \parallel AB$.

$EO \parallel AB \parallel DC$

$AB \parallel DC$ ($\because$ Hence proved)