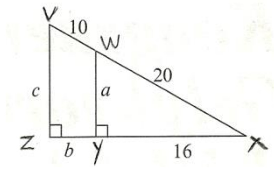
Kongruensie en gelykvormigheid:

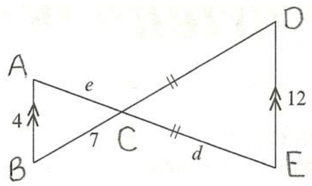
1. Doen die volgende:



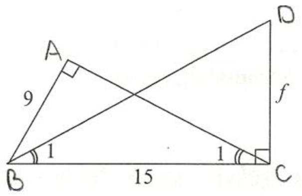
a) Bewys dat $\Delta WXY|||\Delta VXZ$

b) Bereken a, b, c

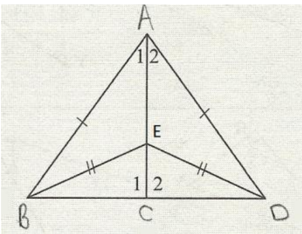
2. Bewys dat $\Delta DCE\ |||\Delta BCA$ en bereken dan *d* en *e*:



3. Bewys dat $\Delta ABC|||\Delta CDB$ en bereken dan *f*:

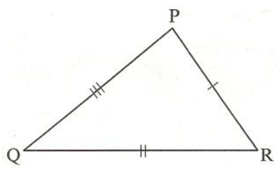


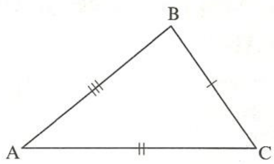
4. Gebruik die volgende figuur om te bewys dat $AC \perp BD$



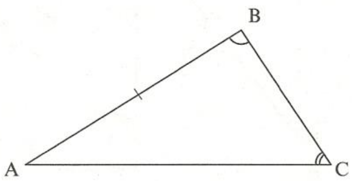
5. Sê of die volgende driehoeke kongruent is en indien wel, gee die driehoeke in die regte volgorde en noem die voorwaardes waaraan dit voldoen:

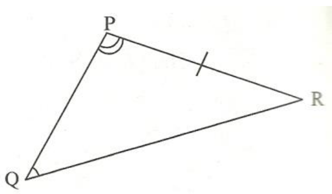
a)

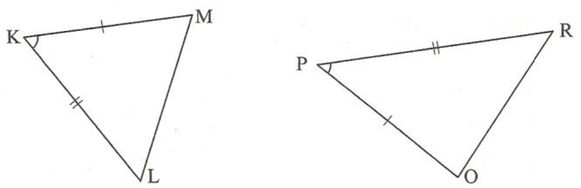




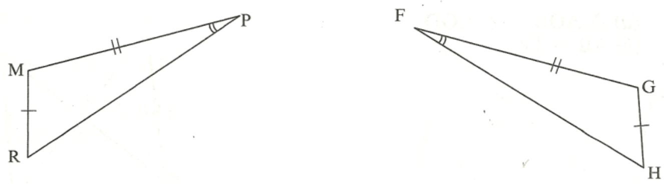
b)





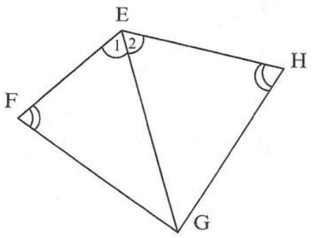


c)

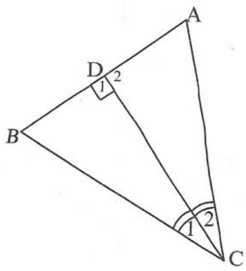


d)

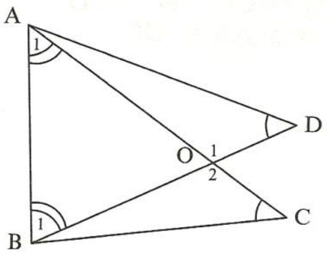
6. In die volgende figuur is $\hat{E}_1 = \hat{E}_2$ en $\widehat{H} = \widehat{F}$
Bewys dat $\Delta FEG \equiv \Delta HEG$



7. Gebruik kongruensie om die volgende te bewys: $AD = DB$ $(\hat{C}_1 = \hat{C}_2)$

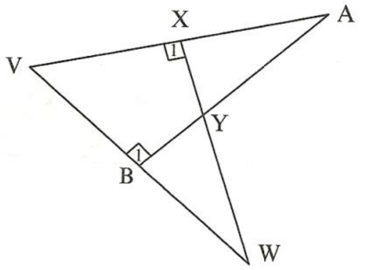


8. Gerbuik die volgende figuur om die vrae te beantwoord:

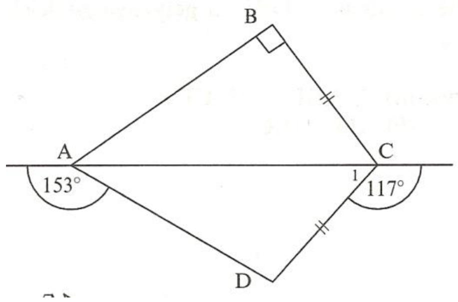


a) Bewys dat $\Delta ABD \equiv \Delta BAC$
b) Bewys: $\Delta AOD \equiv \Delta BOC$

9. Bewys dat $\Delta ABV \equiv \Delta WXV$ as $AB = XW, V\hat{X}W = 90° = A\hat{B}V$

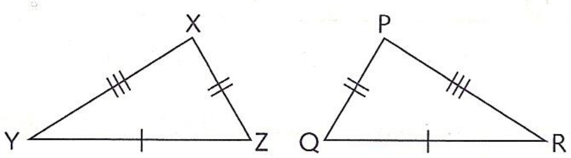


10. Gerbuik die figuur om te bewys dat *AB=AD*

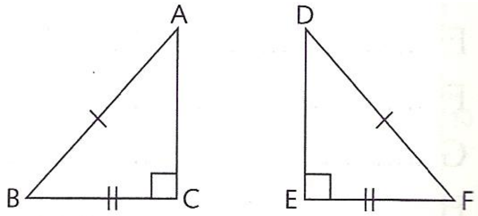


11. Noem die kongruente driehoeke en gee die voorwaardes vir elk van die volgende:

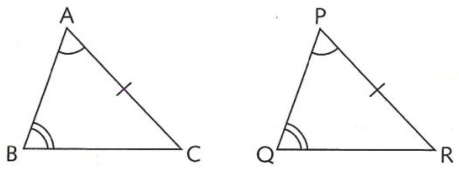
a)



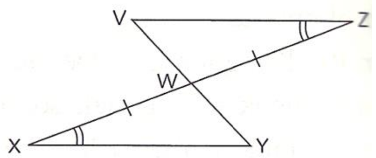
b)



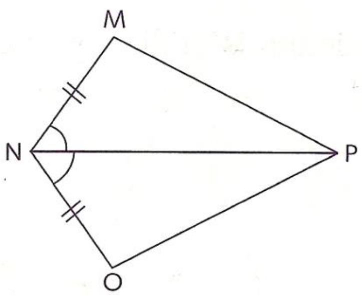
c)



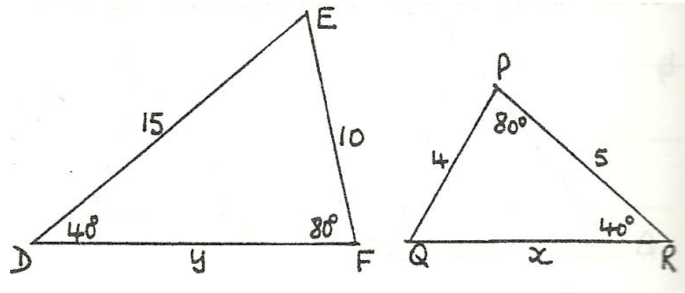
d)

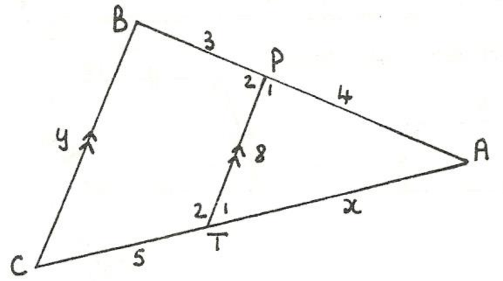


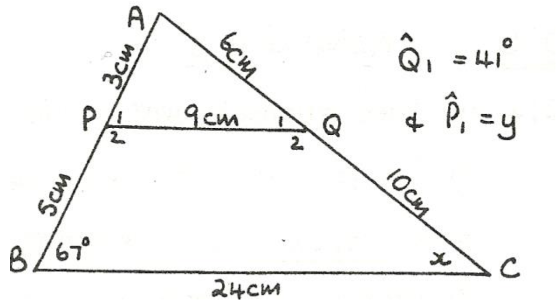
e)



12. Bereken x en y in elk van die volgende:

a) 

b) 

c) 

Memo:

1.a) $In\ \Delta^e\ WXY\ en\ VXZ$:

$\hat{X}\ is\ gemeen$

$\hat{Z} = \hat{Y}\ (90°, gegee)$

$\therefore\ \Delta WXY|||\Delta VXZ\ (\angle, \angle)$

b.) $a^2 = 20^2 - 16^2\ \left(Pyth.; B\widehat{D}C = 90°\right)$

$a^2 = 400 - 256$

$a^2 = 144$

$a = \sqrt{144}$

$a = 12$

Uit gelykvormigheid:

$$\frac{WX}{VX} = \frac{XY}{XZ} = \frac{WY}{VZ}$$

$$\frac{20}{30} = \frac{16}{XZ} = \frac{12}{c}$$

$\therefore\ 20XZ = 16 \times 30$

$XZ = 24$

$\therefore\ b = 8$

Uit gelykvormigheid:

$$\frac{20}{30} = \frac{12}{c}$$

$20c = 12 \times 30$

$c = 18$

- **2.** $In\ \Delta^e\ DCE\ en\ BCA$:
- $\widehat{K} = \widehat{N}\ (Verwis. \angle^e, AB||DE)$
- $\widehat{B} = \widehat{D}\ (Verwis. \angle^e, AB||DE)$

$\therefore\ \Delta DCE|||\Delta BCA\ (\angle, \angle)$

Uit gelykvormigheid:

$$\frac{DC}{BC} = \frac{CE}{CA} = \frac{DE}{BA}$$

$$\frac{d}{7} = \frac{d}{e} = \frac{12}{4}\left(= \frac{3}{1}\right)$$

$\therefore d = 21\ en\ e = 7$

3. $In\ \Delta^e\ ABC\ en\ CDB$

- $\hat{A} = D\hat{C}B\ (= 90°; gegee)$
- $\hat{B}_1 = \hat{C}_1\ (gegee)$

$\therefore \Delta ABC|||\Delta CDB\ (\angle, \angle)$

$AC^2 = 15^2 - 9^2$ (Pyth; $\hat{A} = 90°$)

$AC^2 = 225 - 81$

$AC^2 = 144$

$AC = 12$

Uit gelykvormigheid:

$$\frac{AB}{CD} = \frac{BC}{DB} = \frac{AC}{CB}$$

$$\frac{9}{f} = \frac{12}{15}$$

$12f = 9 \times 15$

$f = 11{,}25$

4. $In\ \Delta^e\ ABE\ en\ ADE$:

- $AB = AD\ (gegee)$
- $BE = ED\ (gegee)$
- $AE\ is\ gemeen$

$\therefore \Delta ABE \equiv \Delta ADE\ (S, S, S)$

$\therefore \hat{A}_1 = \hat{A}_2$

$In\ \Delta^e\ ABC\ en\ ADC$:

- ❖ $AB = AD\ (gegee)$
- ❖ $AC\ is\ gemeen$
- ❖ $\hat{C}_1 = \hat{C}_2\ (reeds\ bewys\ hierbo)$

$\therefore \Delta ABC \equiv \Delta ADC\ (S, \angle, S)$

$\therefore \hat{C}_1 = \hat{C}_2$

$\therefore AC \perp BD\ (BCD\ is\ 'n\ gestrekte\ hoek)$

5. a) $\Delta PQR \equiv \Delta BAC\ (S, S, S)$

b) $Nie\ kongruent\ nie$

c) $\Delta KLM \equiv \Delta PRO\ (S, \angle, S)$

d) *Nie kongruent nie*

6. $In\ \Delta^{e}\ FEG\ en\ HEG$:

- ❖ $\hat{E}_1 = \hat{E}_2\ (gegee)$
- ❖ $\hat{F} = \hat{H}\ (gegee)$
- ❖ $EG\ is\ gegee$

$\therefore \Delta FEG \equiv \Delta HEG\ (\angle, \angle, S)$

7. $In\ \Delta^{e}\ ACD\ en\ BCD$:

- ❖ $\hat{C}_1 = \hat{C}_2\ (gegee)$
- ❖ $CD\ is\ gemeen$
- ❖ $\hat{D}_1 = \hat{D}_2\ (= 90°; ADB\ is\ gestrekte\ hoek)$

$\therefore \Delta ACD \equiv \Delta BCD\ (\angle, \angle, S)$

$\therefore AD = BD$

8.a) $In\ \Delta^{e}\ ABD\ en\ BAC$:

- ❖ $AB\ is\ gemeen$
- ❖ $\hat{A}_1 = \hat{B}_1\ (gegee)$
- ❖ $\hat{C} = \hat{D}\ (gegee)$

$\therefore \Delta ABD \equiv \Delta BAC\ (\angle, \angle, S)$

b) $Uit\ kongruensie: AD = BC$

$In\ \Delta^{e}\ AOD\ en\ BOC$:

- $AD = BC$ $(uit\ kongruensie\ in\ vraag\ a)$
- $\widehat{D} = \hat{C}$ $(gegee)$
- $\hat{O}_1 = \hat{O}_2$ $(Regoorst.\angle^e)$

$\therefore \Delta AOD \equiv \Delta BOC\ (\angle, \angle, S)$

9. $In\ \Delta^e\ ABV\ en\ WXV$:

- $AB = XW$ $(gegee)$
- $\hat{V}\ is\ gemeen$
- $\hat{X}_1 = \hat{B}_1$ $(= 90°\ gegee)$

$\therefore \Delta ABV \equiv \Delta WXV\ (\angle, \angle, S)$

10. $\hat{C} = 63°\ (gestrekte\ \angle)$

$\widehat{D} = 153° - 63°\ (Buite\ \angle\ van\ \Delta ACD)$

$= 90°$

$In\ \Delta^e\ ABC\ en\ ADC$:

- $AC\ is\ gemeen$
- $\hat{B} = \widehat{D}$ $(= 90°, gegee\ en\ bewys)$
- $BC = CD$ $(gegee)$

$\therefore \Delta ABC \equiv \Delta ADC\ (90°, sks, S)$

$\therefore AB = AD\ (uit\ kongruensie)$

11.a) $\Delta XYZ \equiv \Delta PRQ\ (S, S, S)$

b) $\Delta ABC \equiv \Delta DFE\ (90°, skuinssy, S)$

c) $\Delta ABC \equiv \Delta PQR\ (\angle, \angle, Ooreenst. S)$

d) $\Delta VWZ \equiv \Delta YWX\ (\angle, S\angle)$

e) $\Delta VWZ \equiv \Delta YWX\ (\angle, S, \angle)$

12.a) $\widehat{D} = \hat{R}, \hat{F} = \hat{P}, \hat{E} = \hat{Q}$

$\Delta DFE ||| \Delta RPQ\ (\angle, \angle, \angle)$

$\therefore \frac{DF}{RP} = \frac{FE}{PQ} = \frac{DE}{RQ}$ (uit gelykvormigheid)

$\therefore \frac{10}{4} = \frac{15}{x}$ $\qquad\qquad$ $\frac{y}{5} = \frac{10}{4}$

$10x = 60$ $\qquad$ $y = \frac{25}{2}$

$x = 6$ $\qquad$ $y = 12{,}5$

b) $\hat{A} = \hat{A}, \hat{P}_1 = \hat{B}, \hat{T}_1 = \hat{C}$

$\Delta APT|||ABC$ $(\angle, \angle, \angle)$

$\therefore \frac{AP}{AB} = \frac{PT}{BC} = \frac{AT}{AC}$

$\therefore \frac{4}{7} = \frac{x}{x+5}$ $\qquad$ $\frac{8}{y} = \frac{4}{7}$

$4x + 20 = 7x$ $\qquad$ $56 = 4y$

$20 = 3x$ $\qquad$ $14 = y$

$\frac{20}{3} = x$

c) $\frac{AP}{AB} = \frac{3}{8}$

$\frac{AQ}{AC} = \frac{6}{16} = \frac{3}{8}$

$\frac{PQ}{BC} = \frac{9}{24} = \frac{3}{8}$

$\therefore$ ΔAPQ|||ΔABC

$\therefore \hat{P}_1 = \hat{B}$ $\qquad$ $\hat{Q}_1 = \hat{C}$

$y = 67°$ $\qquad$ $x = 41°$