Werkkaart 2015-8.AN-00003(1)

(1) Is die volgende bewerings waar of vals?

(a) Alle reghoekige driehoeke is ook gelykbenig.

Vals

(b) Die som van die binnehoeke van 'n gelyksydige driehoek is 180°.

Waar

(c) Die stelling van Pythagoras kan slegs toegepas word in 'n reghoekige driehoek.

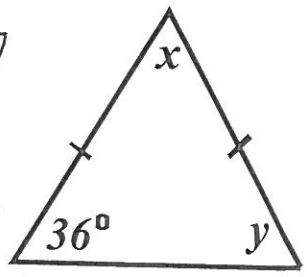
Waar

(d) Die hoeke teenoor die gelyke sye van 'n gelykbenige driehoek is ewe groot.

Waar

(2) Bereken die waardes van x, y en/of k in elk van die volgende sketse. Gee volledige redes:

(a)



$y = 36°$ [$\angle^e$ teenoor gelyke sye]

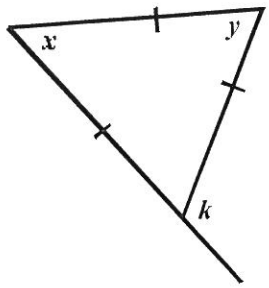
$x + y + 36° = 180°$ [binne $\angle^e$ van $\triangle$]

$\therefore x + 36° + 36° = 180°$

$\therefore x = 180° - 36° - 36°$

$\therefore x = 108°$

(b)



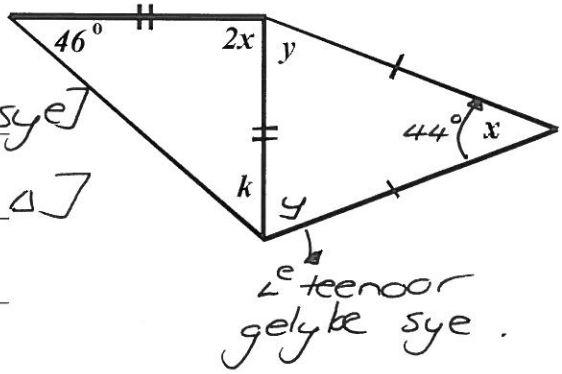
$x = y = 60°$ [$\angle^e$ van gelyksydige $\triangle$]

$x + y = k$ [buite $\angle$ van $\triangle$]

$\therefore k = 60° + 60°$

$\therefore k = 120°$

(c)



$k = 46°$ [$\angle^e$ teenoor gelyke sye]

$2x + 46° + k = 180°$ [binne $\angle^e$ van $\triangle$]

$\therefore 2x = 180° - 46° - 46° = 88°$

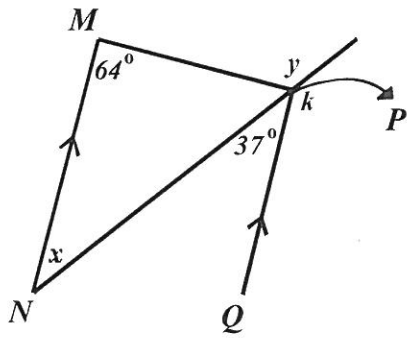
$\therefore x = \frac{88°}{2} = 44°$

$\therefore y + y + 44° = 180°$ [binne $\angle^e$ van $\triangle$]

$2y = 180° - 44° = 136°$

$\therefore y = \frac{136°}{2} = 68°$

(d)



$x = 37°$ [verw. $\angle^e$; $MN \parallel PQ$]

$y = 64° + 37°$ [buite $\angle$ van $\triangle$]

$\therefore y = 101°$

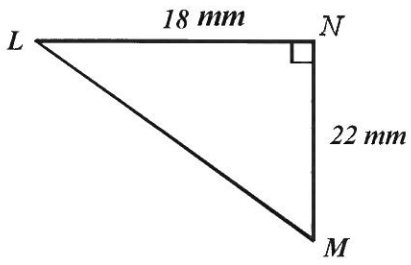
$k + 37° = 180°$ [$\angle^e$ op reguitlyn]

$\therefore k = 180° - 37°$

$\therefore k = 143°$

(3) Bereken die lengte van die onbekende sy in elk van die volgende:
Waar nodig, los die antwoord in wortelvorm.
Bereken ook telkens die oppervlakte van elke driehoek.

(a)



$LM^2 = LN^2 + NM^2$ [Pythagoras]

$= (18)^2 + (22)^2$

$= 324 + 484$

$LM^2 = 808$

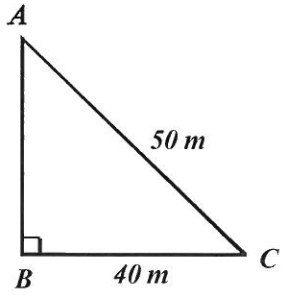
$\therefore LM = \sqrt{808}$ mm

Opp $\triangle LMN = \frac{1}{2} b \times h$

$= \frac{1}{2} (18\text{mm}) \times (22\text{ mm})$

$= 198\text{ mm}^2$

(b)



$AC^2 = AB^2 + BC^2$ [Pythagoras]

$(50)^2 = AB^2 + (40)^2$

$2500 = AB^2 + 1600$

$2500 - 1600 = AB^2$

$\therefore AB^2 = 900$

$\therefore AB = \sqrt{900}$

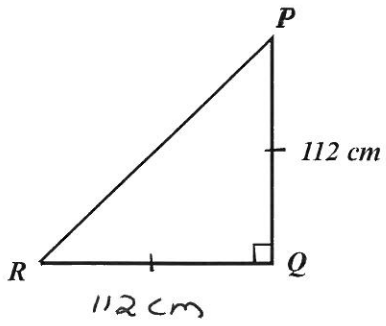
$\therefore AB = 30\text{ m}$

Opp $\triangle ABC = \frac{1}{2} b \times h$

$= \frac{1}{2} (40\text{m}) \times (30\text{m})$

$= 600\text{ m}^2$

(c)



$PR^2 = PQ^2 + RQ^2$ [Pythagoras]

$= (112)^2 + (112)^2$

$= 12\,544 + 12\,544$

$PR^2 = 25\,088$

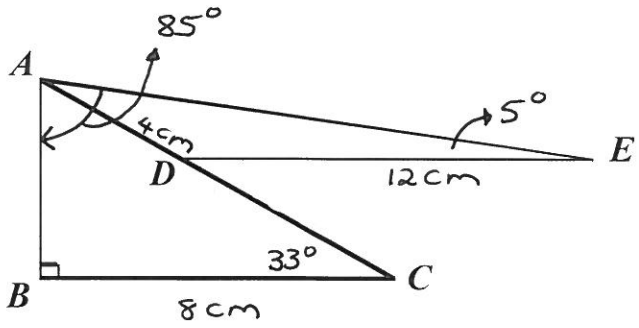
$\therefore PR = \sqrt{25\,088}$ cm

Opp $\triangle PQR = \frac{1}{2} b \times h$

$= \frac{1}{2} (112\text{ cm}) \times (112\text{ cm})$

$= 6\,272\text{ cm}^2$

(4) In die skets is $\hat{E} = 5°$, $\hat{C} = 33°$, $B\hat{A}E = 85°$.
AC = 10 cm, BC = 8 cm, AD = 4 cm en DE = 12 cm.



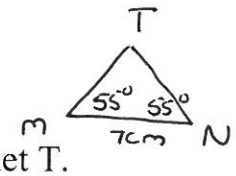
(a) Bewys dat DE // BC. Toon alle berekeninge.
(b) Bereken die lengte van AB.
(c) Bereken die oppervlaktes van Δ ABC en Δ ADE, indien moontlik.

(a) $B\hat{A}C = 180° - \hat{C} - \hat{B}$ [Binne ∠e van Δ]
$= 180° - 33° - 90°$
$\therefore B\hat{A}C = 57°$
$\therefore D\hat{A}C = 85° - 57°$ [$B\hat{A}C = 85°$ gegee]
$\therefore D\hat{A}C = 28°$
maar $E\hat{D}C = D\hat{A}C + \hat{E}$ [buite ∠ van Δ]
$\therefore E\hat{D}C = 28° + 5°$
$\therefore E\hat{D}C = 33°$
$\therefore E\hat{D}C = \hat{C} = 33°$
maar dit is verwisselende ∠e
$\therefore$ DE // BC

(b) $AC^2 = AB^2 + BC^2$
$(10)^2 = AB^2 + (8)^2$
$100 = AB^2 + 64$
$\therefore AB^2 = 100 - 64 = 36$
$\therefore AB = \sqrt{36} = 6$ cm

(c) Opp Δ ABC $= \frac{1}{2} b \times h$
$= \frac{1}{2}(8\text{cm}) \times (6\text{cm})$
$= 24\ \text{cm}^2$
Kan nie opp van Δ ADE bereken nie, want die loodregte hoogte is onbekend.

(5) (a) Konstrueer driehoek MNT met MN = 7 cm, $\widehat{M} = 55° = \widehat{N}$.

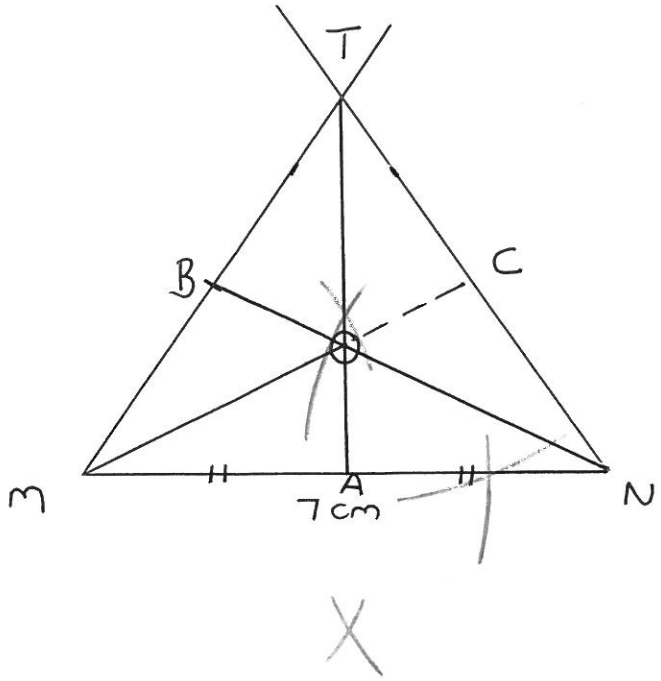


(b) Halveer MN en benoem die middelpunt van MN as A. Verbind A met T.

(c) Halveer MT en benoem die middelpunt van MT as B. Verbind B met N.

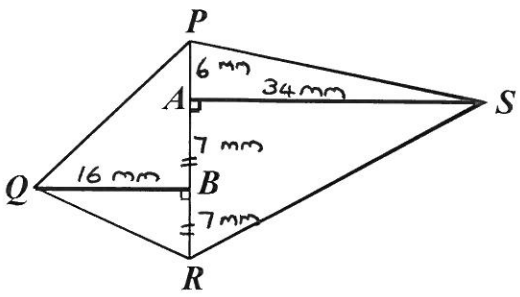
(d) Benoem die snypunt van AT en BN as O.

(e) Verbind M en O en verleng MO om TN in C te sny. Meet TC en CN.



TC = 3cm
CN = 3cm

(6) Bereken die oppervlakte van PQRS, as AS = 34 mm, BQ = 16 mm, AB = BR = 7 mm en AP = 6 mm.



PR = 6mm + 7mm + 7mm = 20 mm

∴ opp $\triangle$ PQR = $\frac{1}{2}$ b x h

= $\frac{1}{2}$ x (RP) x (BQ) = $\frac{1}{2}$ x (20mm) x (16mm)

= 160 mm^2

opp $\triangle$ PSR = $\frac{1}{2}$ b x h

= $\frac{1}{2}$ (PR) x (AS) = $\frac{1}{2}$ x (20mm) x (34 mm)

= 340 mm^2

∴ Opp PQRS = opp $\triangle$PQR + opp $\triangle$ PSR

= 160 mm^2 + 340 mm^2

= 500 mm^2