Uitwerkingen examen schakelcursus wiskunde 2011

1   a) $\sin\beta = \dfrac{AM}{AB} \to \sin 60° = \dfrac{AM}{10} \to AM = 10 \times \sin 60° = 8,6603\ \text{cm} \to AM = \boxed{8,6603\ \text{cm}}$

     b) $A = \tfrac{1}{2} \cdot r^2 \cdot \sin\alpha \to A = \tfrac{1}{2} \times 10^2 \times \sin 60° = \boxed{43,301\ \text{cm}^2}$

     c) $\cos\angle TAM = \dfrac{5}{8,6603} \to \angle TAM = \boxed{54,736°}$

     d) $\sin 54,736 = \dfrac{h}{10} \to h = 10 \times \sin 54,736 = \boxed{8,1650\ \text{cm}}$

     e) $V = \tfrac{1}{3} \cdot A_{\text{grondvlak}} \cdot h = \tfrac{1}{3} \times 43,301 \times 8,1650 = \boxed{117,85\ \text{cm}^2}$

2   a) $X_{z,\text{driehoek}} = 12 + \tfrac{1}{3} \times 6 = \boxed{14}$; $Y_{z,\text{driehoek}} = \tfrac{1}{3} \times 12 = \boxed{4,0000}$

     b) $X_{z,\text{cirkel}} = \boxed{-6,0000}$; $Y_{z,\text{cirkel}} = \boxed{6,0000}$

     c)

	A_n	x_{zn}	y_{zn}
Driehoek	36	14	4
Cirkel	113,0973	-6	6
Vierkant	144	6	6
A_{tot}	293,0973		

$A_{\text{tot}} \cdot x_z = A_1 \cdot x_{z1} + A_2 \cdot x_{z2} + A_3 \cdot x_{z3} \to$
$293,0973 \times x_z = 36 \times 14 + 113,0973 \times \text{-}6 + 144 \times 6 \to x_z = \boxed{2,3522\ \text{cm}}$

$A_{\text{tot}} \cdot y_z = A_1 \cdot y_{z1} + A_2 \cdot y_{z2} + A_3 \cdot y_{z3} \to$
$293,0973 \times y_z = 36 \times 4 + 113,0973 \times 6 + 144 \times 6 \to y_z = \boxed{5,7543\ \text{cm}}$

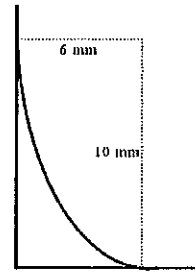3   a) Interval: $O = 10$; $B = 100$; $a = 12 \div 15 = 0,8 \to$

       Waarde $x = O \cdot \left(\dfrac{B}{O}\right)^a = 10 \times \left(\dfrac{100}{10}\right)^{0,8} = \boxed{63,096}$

   b) $P = \dfrac{A^2 + B}{C} \xrightarrow[\text{vermenigvuldigen}]{\text{kruislings}} A^2 + B = P \cdot C \to A^2 = P \cdot C - B \to \boxed{A = \sqrt{P \cdot C - B}}$

c)

4 a) $A_{las} = A_{vierkant} - A_{sector} \rightarrow A_{las} = 6 \times 10 - \frac{1}{4} \times \pi \times 6 \times 10 = \boxed{12,8761 \text{ mm}^2}$

6 mm

10 mm

b) $V = A \cdot l \rightarrow V = 12,8761 \times 150 = \boxed{1931,42 \text{ mm}^3}$

c) $a^2 = b^2 + c^2 - 2 \cdot b \cdot c \cdot \cos\alpha \rightarrow 4^2 = 5^2 + 6^2 - 2 \times 5 \times 6 \times \cos\alpha \rightarrow$
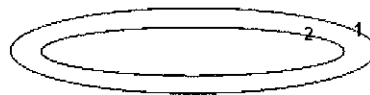$16 = 25 + 36 - 60 \times \cos\alpha \rightarrow -45 = -60 \times \cos\alpha \rightarrow \cos\alpha = 0,75 \rightarrow \alpha = 46,0107°$
$z^2 = 5^2 + 3^2 - 2 \times 5 \times 3 \times \cos 46,0107° = 11,5 \rightarrow z = \boxed{3,3912 \text{ cm}}$

5 a) $A_{ring} = A_1 - A_2 \rightarrow$
$A_{ring} = \pi \times 7,5 \times 5 - \pi \times 6 \times 3,5 = \boxed{51,8363 \text{ cm}^2}$

b) $V = A_2 \cdot h \rightarrow V = \pi \times 6 \times 3,5 \times (12 - 1,5) = \boxed{692,7212 \text{ cm}^3}$

c) $O_{buitenmantel} \approx \pi \cdot \left(3 \cdot (a+b) - \sqrt{(3a+b)(a+3b)}\right) \rightarrow$
$O_{buitenmantel} \approx \pi \cdot \left(3 \cdot (7,5+5) - \sqrt{(3 \times 7,5+5)(7,5+3 \times 5)}\right) = 39,6636 \text{ cm}$
$A_{mantel} = O \cdot h \rightarrow A_{mantel} = 39,6636 \times 12 = \boxed{475,9631 \text{ cm}^2}$

6 a) Middelpuntshoek wordt in achten gedeeld $\rightarrow \angle M = 45° \rightarrow \angle A = \angle B = \boxed{67,5°}$

b) $A = \frac{1}{2} \times 5 \times 5 \times \sin(45°) = \boxed{8,8388 \text{ cm}^2}$

c) $A = \frac{45}{360} \times \pi \times 5^2 = \boxed{9,8175 \text{ cm}^2}$

d) $A_{cirkelsegment} = A_{cirkelsector} - A_{cirkeldriehoek} = 9,8175 - 8,8388 = \boxed{0,9787 \text{ cm}^2}$