

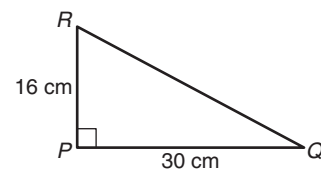
# Diagnostische toets

bladzijde 32

**1** a  $100 + 400 = ?$   
 $? = 500 \text{ mm}^2$

b  $150 + ? = 625$   
 $\boxed{-150}$     $\boxed{-150}$   
 $? = 475 \text{ mm}^2$

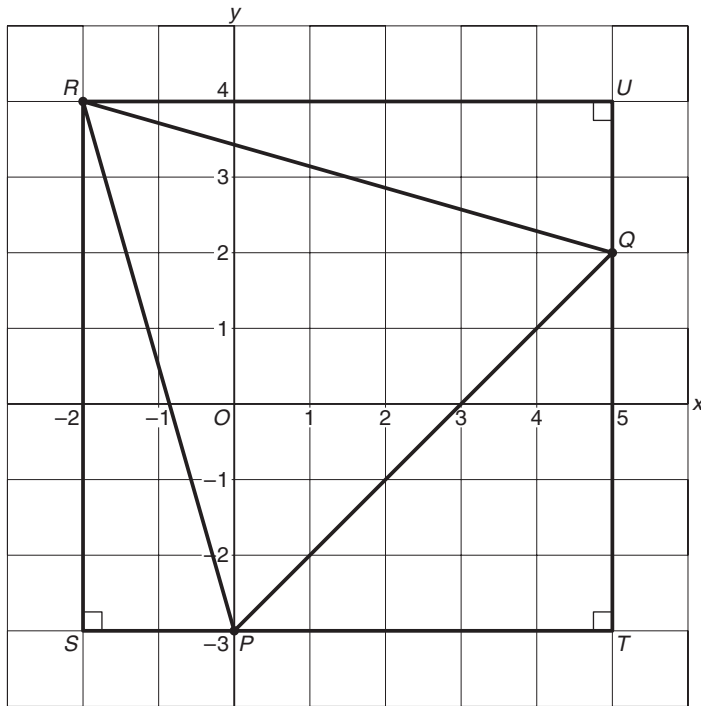
**2**  $\angle P = 90^\circ$ , dus  $PQ^2 + PR^2 = QR^2$   
 $30^2 + 16^2 = QR^2$   
 $900 + 256 = QR^2$   
 $QR^2 = 1156$   
 $QR = \sqrt{1156} = 34 \text{ cm}$



**3**  $\angle A = 90^\circ$ , dus  $AB^2 + AE^2 = BE^2$   
 $4^2 + 3^2 = BE^2$   
 $16 + 9 = BE^2$   
 $BE^2 = 25$   
 $BE = \sqrt{25} = 5$   
 $\angle E = 90^\circ$ , dus  $BE^2 + DE^2 = BD^2$   
 $25 + 3^2 = BD^2$   
 $25 + 9 = BD^2$   
 $BD^2 = 34$   
 $BD = \sqrt{34}$   
 $\angle B = 90^\circ$ , dus  $BC^2 + BD^2 = CD^2$   
 $2^2 + 34 = CD^2$   
 $4 + 34 = CD^2$   
 $CD^2 = 38$   
 $CD = \sqrt{38} \approx 6,2 \text{ cm}$

**4** Recht onder  $D$  ligt punt  $P$ .  
 $AP = AB - CD = 4,2 - 1,5 = 2,7$   
In de rechthoekige driehoek  $APD$  geldt:  
 $\angle P = 90^\circ$ , dus  $AP^2 + PD^2 = AD^2$   
 $2,7^2 + 3,1^2 = AD^2$   
 $7,29 + 9,61 = AD^2$   
 $AD^2 = 16,9$   
 $AD = \sqrt{16,9} \approx 4,1 \text{ cm}$   
Omtrek  $ABCD \approx 4,2 + 3,1 + 1,5 + 4,1 = 12,9 \text{ cm}$

5



$$\angle S = 90^\circ, \text{ dus } PS^2 + RS^2 = PR^2$$

$$2^2 + 7^2 = PR^2$$

$$4 + 49 = PR^2$$

$$PR^2 = 53$$

$$PR = \sqrt{53}$$

$$\angle T = 90^\circ, \text{ dus } PT^2 + QT^2 = PQ^2$$

$$5^2 + 5^2 = PQ^2$$

$$25 + 25 = PQ^2$$

$$PQ^2 = 50$$

$$PQ = \sqrt{50}$$

$$\angle U = 90^\circ, \text{ dus } QU^2 + RU^2 = QR^2$$

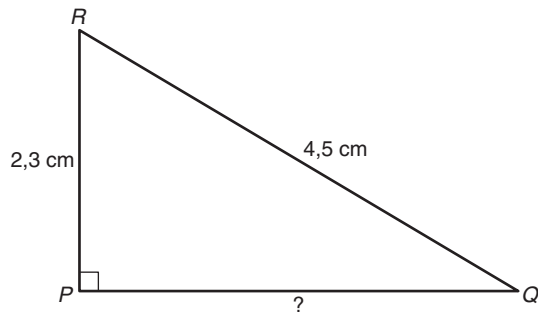
$$2^2 + 7^2 = QR^2$$

$$4 + 49 = QR^2$$

$$QR^2 = 53$$

$$QR = \sqrt{53}$$

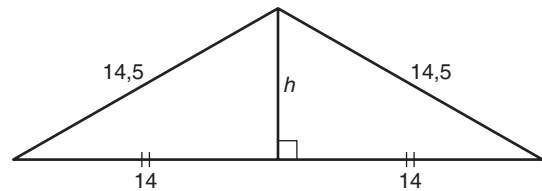
$QR = PR$ , dus  $\triangle PQR$  is gelijkbenig.

**6**

$$\begin{aligned}
 \angle P = 90^\circ, \text{ dus } PR^2 + PQ^2 &= QR^2 \\
 2,3^2 + PQ^2 &= 4,5^2 \\
 5,29 + PQ^2 &= 20,25 \\
 \boxed{-5,29} & \quad \boxed{-5,29} \\
 PQ^2 &= 14,96 \\
 PQ &= \sqrt{14,96} \approx 3,9 \text{ cm}
 \end{aligned}$$

**7**

$$\begin{aligned}
 14^2 + h^2 &= 14,5^2 \\
 196 + h^2 &= 210,25 \\
 \boxed{-196} & \quad \boxed{-196} \\
 h^2 &= 14,25 \\
 h &= \sqrt{14,25} \approx 3,8 \text{ m} \\
 \text{hoogte hangar} &\approx 4,5 + 3,8 = 8,3 \text{ m}
 \end{aligned}$$

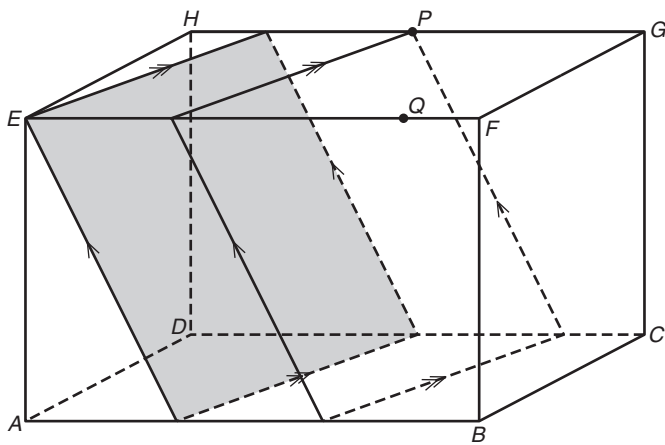


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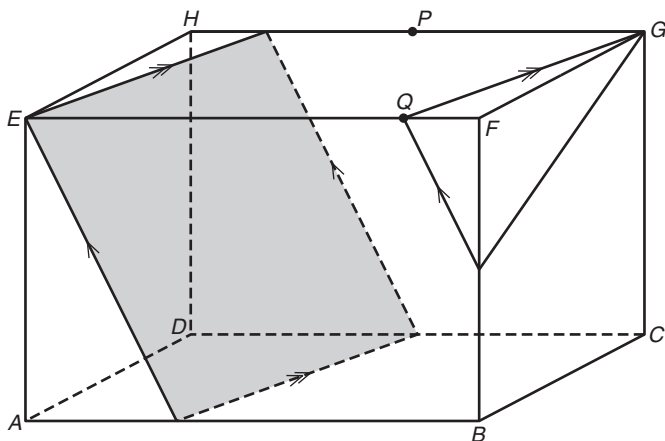
**8**

$$\begin{aligned}
 \text{a } \angle D = 90^\circ, \text{ dus } AD^2 + CD^2 &= AC^2 \\
 35^2 + 12^2 &= AC^2 \\
 1225 + 144 &= AC^2 \\
 AC^2 &= 1369 \\
 AC &= \sqrt{1369} = 37 \\
 \angle D = 90^\circ, \text{ dus } BD^2 + CD^2 &= BC^2 \\
 5^2 + 12^2 &= BC^2 \\
 25 + 144 &= BC^2 \\
 BC^2 &= 169 \\
 BC &= \sqrt{169} = 13 \\
 \text{b } \left. \begin{aligned} AC^2 + BC^2 &= 37^2 + 13^2 = 1538 \\ AB^2 &= (35 + 5)^2 = 1600 \end{aligned} \right\} AC^2 + BC^2 \neq AB^2, \text{ dus is } \triangle ABC \text{ niet rechthoekig.}
 \end{aligned}$$

9 a



b



10 a Schets eerst rechthoek  $BCGF$  en bereken  $CF$ .

$$\begin{aligned} \angle B = 90^\circ, \text{ dus } BC^2 + BF^2 &= CF^2 \\ 5^2 + 4^2 &= CF^2 \\ 25 + 16 &= CF^2 \\ CF^2 &= 41 \\ \angle F = 90^\circ, \text{ dus } CF^2 + EF^2 &= CE^2 \\ 41 + 6^2 &= CE^2 \\ 41 + 36 &= CE^2 \\ CE^2 &= 77 \\ CE &= \sqrt{77} \approx 8,8 \text{ cm} \end{aligned}$$

b  $AP$  ligt in diagonaal vlak  $AFGD$

Schets voorvlak  $ABFE$  en bereken  $AF$ .

$$\begin{aligned} \angle B = 90^\circ, \text{ dus } AB^2 + BF^2 &= AF^2 \\ 6^2 + 4^2 &= AF^2 \\ 36 + 16 &= AF^2 \\ AF^2 &= 52 \\ \angle F = 90^\circ, \text{ dus } AF^2 + FP^2 &= AP^2 \\ 52 + 2,5^2 &= AP^2 \\ 52 + 6,25 &= AP^2 \\ AP^2 &= 58,25 \\ AP &= \sqrt{58,25} \approx 7,6 \text{ cm} \end{aligned}$$

$$\begin{aligned}
\text{c } \angle H = 90^\circ, \text{ dus } AH^2 + HQ^2 &= AQ^2 & (AH^2 = CF^2 = 41) \\
41 + 2^2 &= AQ^2 \\
41 + 4 &= AQ^2 \\
41 + 4 &= AQ^2 \\
AQ^2 &= 45 \\
AQ &= \sqrt{45} \approx 6,7 \text{ cm}
\end{aligned}$$

**11** a  $\angle B = 90^\circ$ , dus  $AB^2 + BC^2 = AC^2$

$$\begin{aligned}
36^2 + 48^2 &= AC^2 \\
1296 + 2304 &= AC^2 \\
AC^2 &= 3600 \\
AC &= \sqrt{3600} = 60 \text{ cm}
\end{aligned}$$

b  $\angle S = 90^\circ$ , dus  $AS^2 + TS^2 = AT^2$

$$\begin{aligned}
30^2 + TS^2 &= 43,5^2 \\
900 + TS^2 &= 1892,25 \\
\boxed{-900} & \qquad \qquad \qquad \boxed{-900} \\
TS^2 &= 992,25 \\
TS &= \sqrt{992,25} \approx 31,5 \text{ cm}
\end{aligned}$$

c  $P$  is het midden van  $AB$ .

De stelling van Pythagoras in  $\triangle PST$ :

$$\begin{aligned}
PT^2 &= PS^2 + TS^2 \\
PT^2 &= 24^2 + 31,5^2 = 1568,25 \\
PT &= \sqrt{1568,25}
\end{aligned}$$

$Q$  is het midden van  $BC$ .

De stelling van Pythagoras in  $\triangle QST$ :

$$\begin{aligned}
QT^2 &= QS^2 + TS^2 \\
QT^2 &= 18^2 + 31,5^2 = 1316,25 \\
QT &= \sqrt{1316,25}
\end{aligned}$$

$$\begin{aligned}
\text{opp}(\text{piramide}) &= \text{opp}(ABCD) + 2 \cdot \text{opp}(\triangle ABT) + 2 \cdot \text{opp}(\triangle BCT) \\
&= 36 \cdot 48 + 2 \cdot \frac{1}{2} \cdot 36 \cdot \sqrt{1568,25} + 2 \cdot \frac{1}{2} \cdot 48 \cdot \sqrt{1316,25} \\
&\approx 4895,1 \text{ cm}^2
\end{aligned}$$