

Wiskunde havo module meetkunde

M. Bos

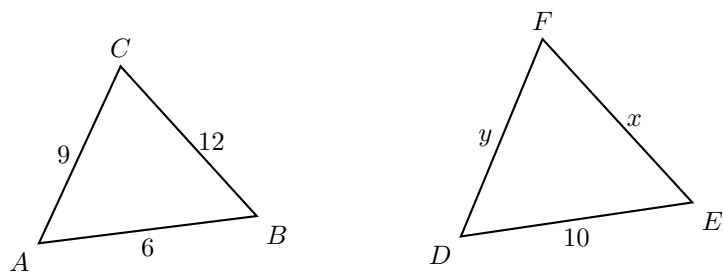
14 februari 2026

Gelijkvormigheid

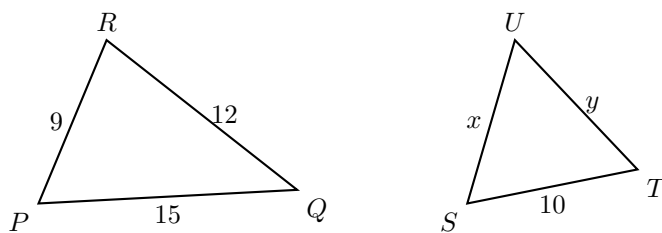
Opgaven (met illustraties)

Twee losse driehoeken die gelijkvormig zijn

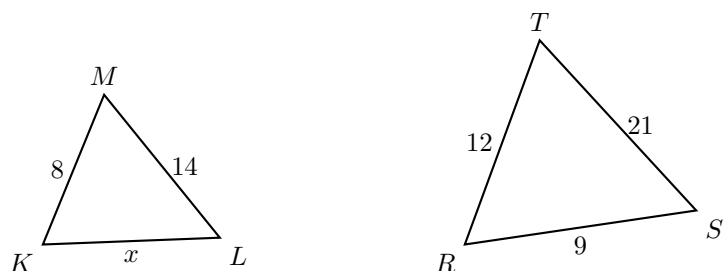
1. **Twee losse driehoeken.** Gegeven: $\triangle ABC \sim \triangle DEF$ (in deze volgorde). In $\triangle ABC$ geldt: $AB = 6$, $AC = 9$, $BC = 12$. In $\triangle DEF$ geldt: $DE = 10$, $EF = x$, $DF = y$.



2. **Twee losse driehoeken.** Gegeven: $\triangle PQR \sim \triangle STU$ (in deze volgorde). $PQ = 15$, $PR = 9$, $QR = 12$. $ST = 10$, $SU = x$, $TU = y$.



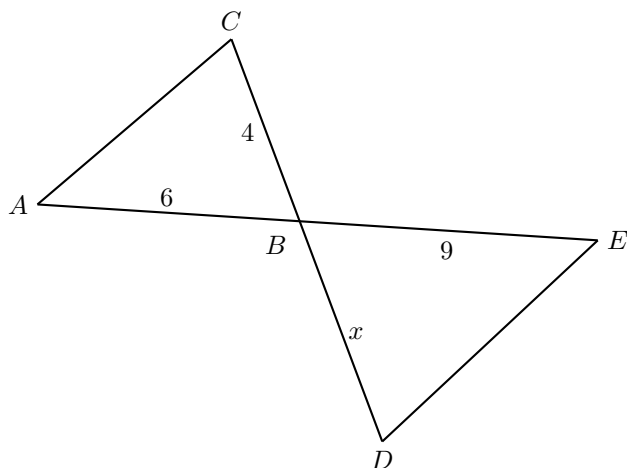
3. **Twee losse driehoeken.** Gegeven: $\triangle KLM \sim \triangle RST$ (in deze volgorde). In $\triangle KLM$: $KL = x$, $KM = 8$, $LM = 14$. In $\triangle RST$: $RS = 9$, $RT = 12$, $ST = 21$. Bereken x .



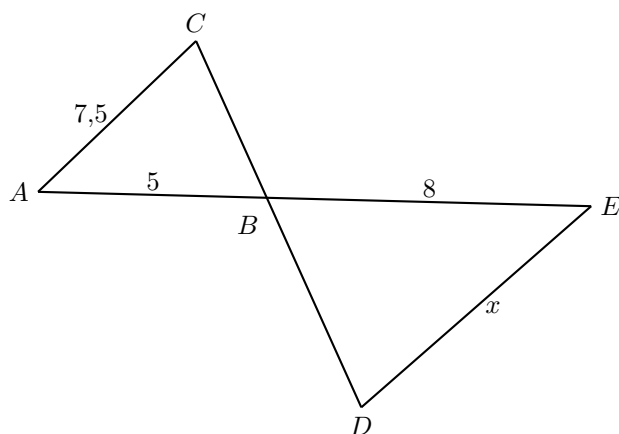
Twée driehoeken met snijpunt B (gemeenschappelijke hoek)

In alle opgaven hieronder geldt: $\triangle ABC \sim \triangle EBD$ (in deze volgorde). De lijnen $A-B-E$ liggen op één lijn en $C-B-D$ liggen op één lijn.

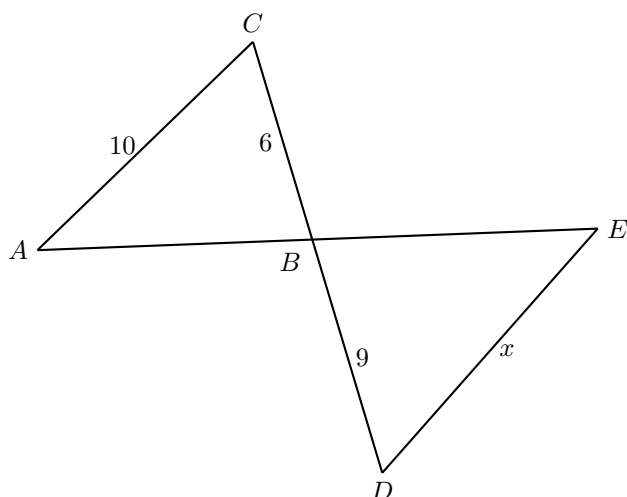
4. Gegeven: $AB = 6$, $BC = 4$, $EB = 9$, $BD = x$. Bereken x .



5. Gegeven: $AB = 5$, $AC = 7,5$, $EB = 8$, $ED = x$. Bereken x .



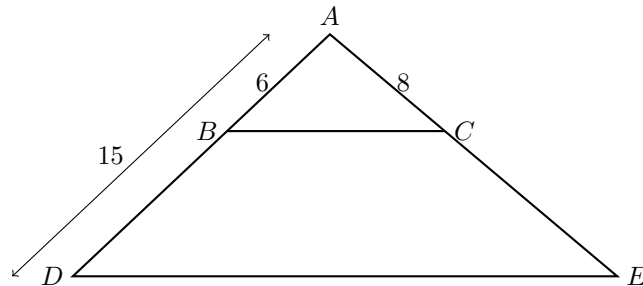
6. Gegeven: $BC = 6$, $AC = 10$, $BD = 9$, $ED = x$. Bereken x .



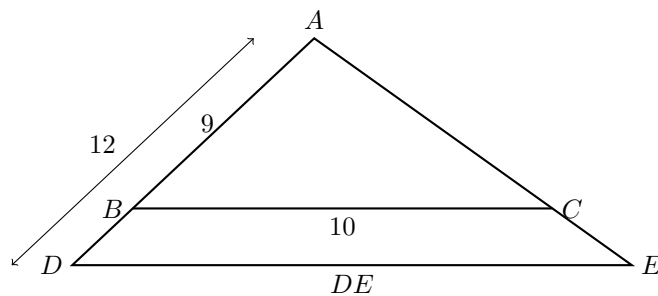
Eén driehoek in de andere (met evenwijdige lijn)

In alle opgaven hieronder geldt: $BC \parallel DE$ en dus $\triangle ABC \sim \triangle ADE$.

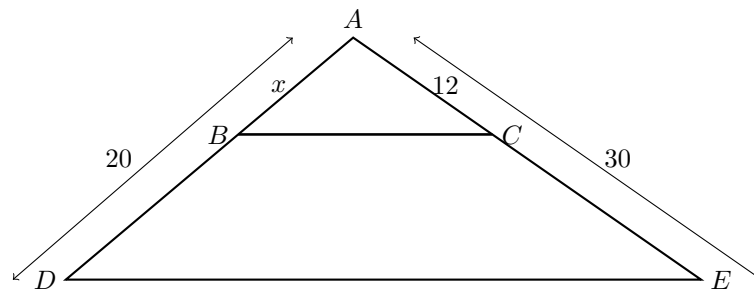
7. Gegeven: $AB = 6$, $AD = 15$, $AC = 8$. Bereken AE .



8. Gegeven: $AB = 9$, $AD = 12$, $BC = 10$. Bereken DE .



9. Gegeven: $AB = x$, $AD = 20$, $AC = 12$, $AE = 30$. Bereken x .



Uitwerkingen

Afspraak bij gelijkvormigheid: als $\triangle ABC \sim \triangle DEF$, dan horen de zijden bij elkaar:

$$AB \leftrightarrow DE, \quad AC \leftrightarrow DF, \quad BC \leftrightarrow EF.$$

1. $\triangle ABC \sim \triangle DEF$.

Verhoudingstabel:

$$\frac{AB}{DE} \mid \frac{AC}{DF} \mid \frac{BC}{EF} = \frac{6}{10} \mid \frac{9}{y} \mid \frac{12}{x}$$

Eerst x met $BC \leftrightarrow EF$:

$$\frac{6}{10} = \frac{12}{x} \Rightarrow 6x = 10 \cdot 12 \Rightarrow 6x = 120 \Rightarrow x = 20$$

Dan y met $AC \leftrightarrow DF$:

$$\frac{6}{10} = \frac{9}{y} \Rightarrow 6y = 10 \cdot 9 \Rightarrow 6y = 90 \Rightarrow y = 15$$

2. $\triangle PQR \sim \triangle STU$.

Verhoudingstabel:

$$\frac{PQ}{ST} \mid \frac{PR}{SU} \mid \frac{QR}{TU} = \frac{15}{10} \mid \frac{9}{x} \mid \frac{12}{y}$$

$$\frac{15}{10} = \frac{9}{x} \Rightarrow 15x = 10 \cdot 9 \Rightarrow 15x = 90 \Rightarrow x = 6$$

$$\frac{15}{10} = \frac{12}{y} \Rightarrow 15y = 10 \cdot 12 \Rightarrow 15y = 120 \Rightarrow y = 8$$

3. $\triangle KLM \sim \triangle RST$.

Bijbehoren: $KL \leftrightarrow RS$, $KM \leftrightarrow RT$, $LM \leftrightarrow ST$.

Verhoudingstabel:

$$\frac{KL}{RS} \mid \frac{KM}{RT} \mid \frac{LM}{ST} = \frac{x}{9} \mid \frac{8}{12} \mid \frac{14}{21}$$

Neem $KM \leftrightarrow RT$:

$$\frac{x}{9} = \frac{8}{12} \Rightarrow 12x = 9 \cdot 8 \Rightarrow 12x = 72 \Rightarrow x = 6$$

4. $\triangle ABC \sim \triangle EBD$.

Bijbehoren: $AB \leftrightarrow EB$ en $BC \leftrightarrow BD$.

Verhoudingstabel:

$$\frac{AB}{EB} \mid \frac{BC}{BD} = \frac{6}{9} \mid \frac{4}{x}$$

$$\frac{6}{9} = \frac{4}{x} \Rightarrow 6x = 9 \cdot 4 \Rightarrow 6x = 36 \Rightarrow x = 6$$

5. $\triangle ABC \sim \triangle EBD$.

Hier horen $AB \leftrightarrow EB$ en $AC \leftrightarrow ED$.

$$\frac{AB}{EB} \mid \frac{AC}{ED} = \frac{5}{8} \mid \frac{7,5}{x}$$

$$\frac{5}{8} = \frac{7,5}{x} \Rightarrow 5x = 8 \cdot 7,5 \Rightarrow 5x = 60 \Rightarrow x = 12$$

6. $\triangle ABC \sim \triangle EBD$.

Gebruik $BC \leftrightarrow BD$ en $AC \leftrightarrow ED$.

$$\frac{BC}{BD} \Big| \frac{AC}{ED} = \frac{6}{9} \Big| \frac{10}{x}$$

$$\frac{6}{9} = \frac{10}{x} \Rightarrow 6x = 9 \cdot 10 \Rightarrow 6x = 90 \Rightarrow x = 15$$

7. $BC \parallel DE$ dus $\triangle ABC \sim \triangle ADE$.

Bijbehoren: $AB \leftrightarrow AD$ en $AC \leftrightarrow AE$.

$$\frac{AB}{AD} \Big| \frac{AC}{AE} = \frac{6}{15} \Big| \frac{8}{AE}$$

$$\frac{6}{15} = \frac{8}{AE} \Rightarrow 6 \cdot AE = 15 \cdot 8 \Rightarrow 6AE = 120 \Rightarrow AE = 20$$

8. $BC \parallel DE$ dus $\triangle ABC \sim \triangle ADE$.

Bijbehoren: $AB \leftrightarrow AD$ en $BC \leftrightarrow DE$.

$$\frac{AB}{AD} \Big| \frac{BC}{DE} = \frac{9}{12} \Big| \frac{10}{DE}$$

$$\frac{9}{12} = \frac{10}{DE} \Rightarrow 9 \cdot DE = 12 \cdot 10 \Rightarrow 9DE = 120 \Rightarrow DE = \frac{120}{9} = \frac{40}{3}$$

9. $BC \parallel DE$ dus $\triangle ABC \sim \triangle ADE$.

Bijbehoren: $AB \leftrightarrow AD$ en $AC \leftrightarrow AE$.

$$\frac{AB}{AD} \Big| \frac{AC}{AE} = \frac{x}{20} \Big| \frac{12}{30}$$

$$\frac{x}{20} = \frac{12}{30} \Rightarrow 30x = 20 \cdot 12 \Rightarrow 30x = 240 \Rightarrow x = 8$$