B 2.2
Kosinus-Satz im Dreieck AED:

$$\overline{ED}^2 = \overline{AE}^2 + \overline{AD}^2 - 2 \cdot \overline{AE} \cdot \overline{AD} \cdot \cos \sphericalangle BAD$$

$$\Leftrightarrow \quad \overline{ED}^2 = [(60 - 10)^2 + 40^2 - 2 \cdot (60 - 10) \cdot 40 \cdot \cos 60°] \text{ m}^2$$

$$\Leftrightarrow \quad \overline{ED}^2 = 2100 \text{ m}^2$$

$$\Leftrightarrow \quad \overline{ED} = 45{,}83 \text{ m}$$

B 2.3

$$A_{blau} = \overline{EB} \cdot \overline{HD} = 10 \text{ m} \cdot 34{,}64 \text{ m} = 346{,}40 \text{ m}^2$$

B 2.4

$\sphericalangle BAC = \sphericalangle DCA = 36{,}67°$

Kosinus-Satz im Dreieck ABC:

$$\overline{BC}^2 = \overline{AB}^2 + \overline{AC}^2 - 2 \cdot \overline{AB} \cdot \overline{AC} \cdot \cos \sphericalangle BAC$$

$$\Leftrightarrow \quad \overline{BC}^2 = [60^2 + 58^2 - 2 \cdot 60 \cdot 58 \cdot \cos 36{,}67°] \text{ m}^2$$

$$\Leftrightarrow \quad \overline{BC}^2 = 1381{,}46 \text{ m}^2$$

$$\Leftrightarrow \quad \overline{BC} = 37{,}17 \text{ m}$$

Sinus-Satz im Dreieck ABC:

$$\frac{\overline{BC}}{\sin \sphericalangle BAC} = \frac{\overline{AB}}{\sin \sphericalangle ACB}$$

$$\Leftrightarrow \sin \sphericalangle ACB = \frac{\sin \sphericalangle BAC \cdot \overline{AB}}{\overline{BC}}$$

$$\Leftrightarrow \sin \sphericalangle ACB = \frac{\sin 36{,}67° \cdot 60}{37{,}17} = 0{,}96$$

$$\Leftrightarrow \sphericalangle ACB = 74{,}58°$$

B 2.5

$\sphericalangle CAD = 180° - \sphericalangle ADC - \sphericalangle DCA = 180° - 120° - 36{,}67° = 23{,}33°$

Sinus-Satz im Dreieck ACD:

$$\frac{\overline{DC}}{\sin \sphericalangle CAD} = \frac{\overline{AC}}{\sin \sphericalangle ADC}$$

$$\Leftrightarrow \overline{DC} = \frac{\overline{AC} \cdot \sin \sphericalangle CAD}{\sin \sphericalangle ADC} \text{ m}$$

$$\Leftrightarrow \overline{DC} = \frac{58 \cdot \sin 23{,}33°}{\sin 120°} \text{ m} = 26{,}52 \text{ m}$$

$$\overline{CF} = \overline{DC} - \overline{EB} = 26{,}52 \text{ m} - 10 \text{ m} = 16{,}52 \text{ m}$$

$$A_{Sektor} = \overline{CF}^2 \cdot \pi \cdot \frac{360° - (\sphericalangle ACB + \sphericalangle DCA)}{360°} \text{ m}^2$$

$$\Leftrightarrow A_{Sektor} = 16{,}52^2 \cdot \pi \cdot \frac{360° - 74{,}58° - 36{,}67°}{360°} \text{ m}^2 = 592{,}42 \text{ m}^2$$

B 2.6

$$A_{blau} = 346{,}40 \text{ m}^2$$

$$A_{Trapez} = 0{,}5 \cdot (\overline{DC} + \overline{AB}) \cdot \overline{HD}$$

$$\Leftrightarrow A_{Trapez} = 0{,}5 \cdot (26{,}52 + 60) \cdot 34{,}64 \text{ m}^2 = 1498{,}53 \text{ m}^2$$

$$A_{alles} = 1498{,}53 \text{ m}^2 + 592{,}42 \text{ m}^2 = 2090{,}95 \text{ m}^2$$

$$(592{,}42 + 346{,}40) : 2090{,}95 = 0{,}4490 \Rightarrow 44{,}90\ \%$$