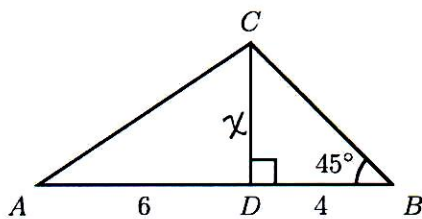


KEY College Trigonometry - Quiz 4

1. In the following diagram, $AD = 6$ cm $DB = 4$ cm, $B = 45^\circ$ and $\overline{AB} \perp \overline{CD}$ find the angle A to the nearest degree.



Let $x = CD$

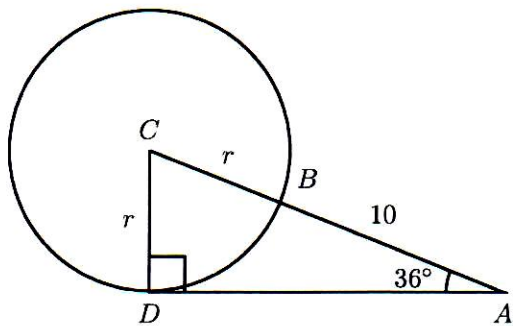
$$\text{In } \triangle BCD: \frac{x}{4} = \frac{\text{Opp}(45^\circ)}{\text{Adj}(45^\circ)} = \tan 45^\circ = 1 \Rightarrow x = 4$$

$$\text{In } \triangle ACD: \frac{x}{6} = \frac{4}{6} = \frac{\text{Opp}(A)}{\text{Adj}(A)} = \tan A$$

$$\tan A = \frac{4}{6} = \frac{2}{3}$$

$$A = \tan^{-1}\left(\frac{2}{3}\right) \sim \boxed{33.69^\circ}$$

2. The circle in the following figure has a radius r cm and the center at C . The distance from A to B is 10 cm, $D = 90^\circ$, and $A = 36^\circ$. Find r .



$$\text{In } \triangle ACD: \frac{r}{r+10} = \frac{\text{Opp}(36^\circ)}{\text{Hyp}} = \sin 36^\circ \sim 0.5878$$

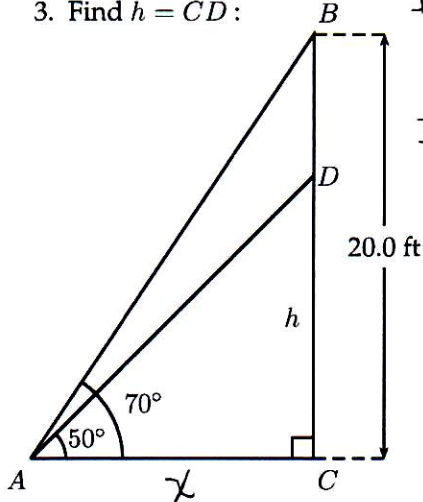
$$r = (r+10) 0.5878$$

$$r = 0.5878r + 5.878$$

$$0.4122r = 5.878$$

$$r = \frac{5.878}{0.4122} \sim \boxed{14.26}$$

3. Find $h = CD$:



Let $x = AB$

$$\text{In } \triangle ABC: \frac{x}{20} = \frac{\text{Adj}(70^\circ)}{\text{Opp}(70^\circ)} = \cot(70^\circ) = \frac{1}{\tan 70^\circ} \sim \frac{1}{2.7475}$$

$$x = 20(0.364) = 7.28 \quad \sim 0.3640$$

$$\text{In } \triangle ADC: \frac{h}{x} = \frac{h}{7.28} = \frac{\text{Opp}(50^\circ)}{\text{Adj}(50^\circ)} = \tan 50^\circ \sim 1.1918$$

$$h = 7.28(1.1918)$$

$$\sim \boxed{8.6763}$$