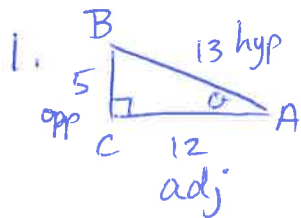


U5/L2 HW p. 280 1-11, (16) ← Make sure all answers are rationalized for 16c



$$\sin \theta = \frac{5}{13} \quad \csc \theta = \frac{13}{5}$$

$$\cos \theta = \frac{12}{13} \quad \sec \theta = \frac{13}{12}$$

$$\tan \theta = \frac{5}{12} \quad \cot \theta = \frac{12}{5}$$

2. If $\sin \theta = \frac{8}{17}$ then $\csc \theta = \frac{17}{8}$

If $\cos \theta = \frac{15}{17}$ then $\sec \theta = \frac{17}{15}$

If $\tan \theta = \frac{8}{15}$ then $\cot \theta = \frac{15}{8}$

3. a) $\sin \theta = \frac{1}{2}$, $\csc \theta = 2$ b) $\cos \theta = \frac{3}{4}$, $\sec \theta = \frac{4}{3}$

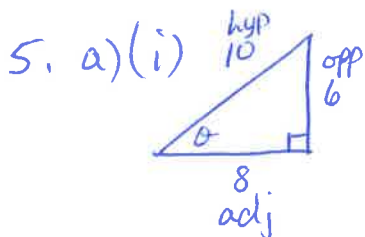
c) $\tan \theta = \frac{3}{2}$, $\cot \theta = \frac{2}{3}$ d) $\tan \theta = \frac{1}{4}$, $\cot \theta = 4$

4. a) $\cos 34^\circ \doteq 0.83$

b) $\sec 10^\circ = \frac{1}{\cos 10^\circ}$
 $\doteq 1.02$

c) $\cot 75^\circ = \frac{1}{\tan 75^\circ}$
 $\doteq 0.27$

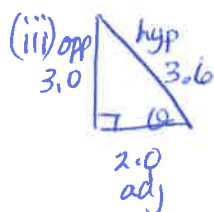
d) $\csc 45^\circ = \frac{1}{\sin 45^\circ}$
 $\doteq 1.41$



$$\csc \theta = \frac{10}{6} \text{ or } \frac{5}{3}$$

$$\sec \theta = \frac{10}{8} \text{ or } \frac{5}{4}$$

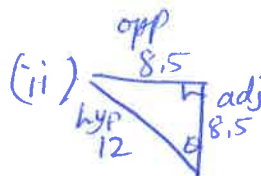
$$\cot \theta = \frac{8}{6} \text{ or } \frac{4}{3}$$



$$\csc \theta = \frac{3.6}{3.0}$$

$$\sec \theta = \frac{3.6}{2.0}$$

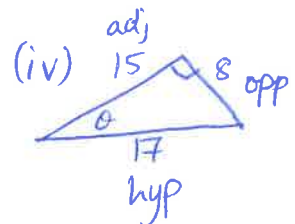
$$\cot \theta = \frac{2.0}{3.0} \text{ or } \frac{2}{3}$$



$$\csc \theta = \frac{12}{8.5}$$

$$\sec \theta = \frac{12}{8.5}$$

$$\cot \theta = \frac{8.5}{8.5} \text{ or } 1$$



$$\csc \theta = \frac{17}{8}$$

$$\sec \theta = \frac{17}{15}$$

$$\cot \theta = \frac{15}{8}$$

b) $\tan \theta = \frac{3}{4}$
 $\theta \doteq 37^\circ$

$\tan \theta = \frac{3}{2}$
 $\theta \doteq 56^\circ$

$\tan \theta = 1$
 $\theta = 45^\circ$

$\tan \theta = \frac{8}{15}$
 $\theta \doteq 28^\circ$

6. a) $\cot \theta = 3.2404$ b) $\csc \theta = 1.2711$ c) $\sec \theta = 1.4526$ d) $\cot \theta = 0.5814$

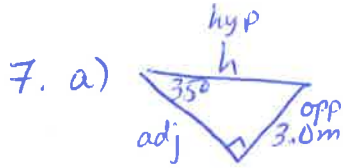
$\tan \theta = \frac{1}{3.2404}$ $\sin \theta = \frac{1}{1.2711}$ $\cos \theta = \frac{1}{1.4526}$ $\tan \theta = \frac{1}{0.5814}$

$\theta \approx 17^\circ$

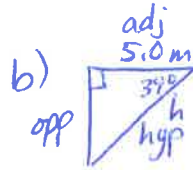
$\theta \approx 52^\circ$

$\theta \approx 46^\circ$

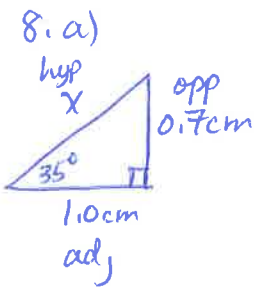
$\theta \approx 60^\circ$



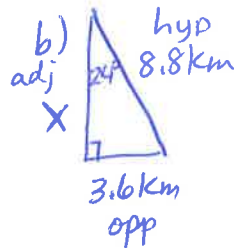
$\sin 35^\circ = \frac{3.0}{h}$
 $h \approx 5.2m$



$\cos 39^\circ = \frac{5.0}{h}$
 $h \approx 6.4m$



(i) $\sin 35^\circ = \frac{0.7}{x}$
 $x \approx 1.2cm$
(ii) $a^2 + b^2 = c^2$
 $1.0^2 + 0.7^2 = x^2$
 $x = \sqrt{1.49}$
 $x \approx 1.2cm$



(i) $\tan 24^\circ = \frac{3.6}{x}$
 $x \approx 8.1km$ ← rounds up to this
(ii) $x^2 = 8.8^2 - 3.6^2$ ← text answer
 $x = \sqrt{64.48}$
 $x \approx 8.0km$

9. a) $\therefore \csc \theta = \frac{\text{hyp}}{\text{opp}}$ and the hypotenuse is always the longest side of a right \triangle

$\therefore \csc \theta$ will always be ≥ 1 .

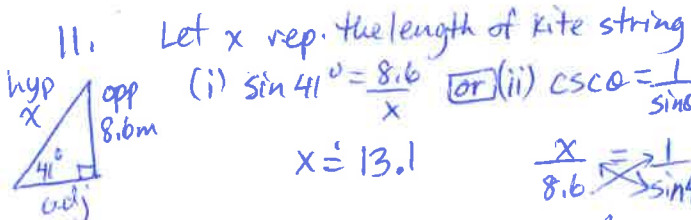
But $\csc \theta = 1$ when $\sin \theta = 1$, in which case $\theta = 90^\circ$

$\therefore \cos \theta = \frac{\text{adj}}{\text{hyp}}$ and the hyp. is always longer than the adj. side

But if $\cos \theta = 1$, then $\theta = 0^\circ$ or 360° ← Not right Δ 's anymore

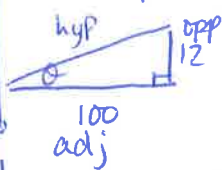
Text has a much more complicated explanation.

10. If $\tan \theta = \cot \theta$, then the adjacent side = opposite side as in an isosceles \triangle where both acute angles are 45°



(i) $\sin 41^\circ = \frac{8.6}{x}$ or (ii) $\csc \theta = \frac{1}{\sin \theta}$
 $x \approx 13.1$
 $\frac{x}{8.6} \rightarrow \frac{1}{\sin 41^\circ}$
 $\sin 41^\circ = \frac{8.6}{x}$
 $x \approx 13.1$

\therefore The string is approx 13.1m long.



b) $\tan \theta = \frac{12}{100}$
 $\theta \approx 7^\circ$

c) $12^2 + 100^2 = h^2$
 $h = \sqrt{10144}$
 $= \sqrt{16 \times 634}$
 $= 4\sqrt{634}$

$\sin \theta = \frac{12}{4\sqrt{634}}$ or $\frac{3\sqrt{634}}{634}$ $\csc \theta = \frac{\sqrt{634}}{3}$
 $\cos \theta = \frac{100}{4\sqrt{634}}$ or $\frac{25\sqrt{634}}{634}$ $\sec \theta = \frac{\sqrt{634}}{25}$
 $\tan \theta = \frac{12}{100}$ or $\frac{3}{25}$ $\cot \theta = \frac{25}{3}$