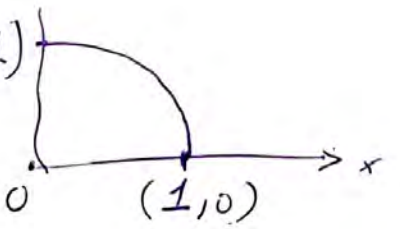
$\sin\theta = \frac{y}{r}$

$\cos\theta = \frac{x}{r}$



$$\begin{cases} x = r\cos\theta \\ y = r\sin\theta \end{cases}$$

(x, y)

$(r\cos\theta, r\sin\theta)$

$(\cos\theta, \sin\theta)$

$30°, 60°, 90°$

$(2t)^2 = h^2 + t^2$

$4t^2 - t^2 = h^2$

$3t^2 = h^2$

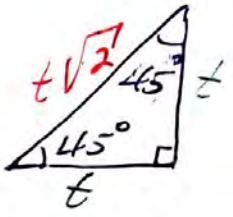
$h = t\sqrt{3}$

$\cos 60° = \frac{t}{2t} = \frac{1}{2}$

$\sin 60° = \frac{h}{2t} = \frac{t\sqrt{3}}{2t}$

$= \frac{\sqrt{3}}{2}$

$\sin 30° \frac{t}{2t} = \frac{1}{2}$



$hyp = \sqrt{t^2 + t^2}$

$= t\sqrt{2}$

$\cos 45° = \frac{t}{t\sqrt{2}} = \frac{1}{\sqrt{2}} = \sin 45°$

$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

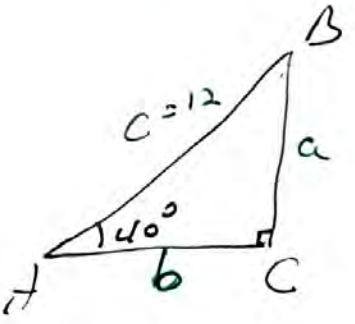
0

$\frac{\sqrt{3}}{2}$ $\frac{1}{2}$

$\frac{\sqrt{2}}{2}$ $\left(\frac{1}{\sqrt{2}}\right)$

1

Ex $\triangle ABC$ $C=90^\circ$ $A=40^\circ$ $c=12$



$\angle B = 90^\circ - A$
$= 90^\circ - 40^\circ$
$= 50^\circ$

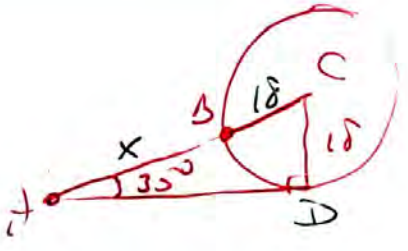
$\cos 40^\circ = \frac{b}{12}$

$b = 12\cos 40^\circ$

$\sin 40^\circ = \frac{a}{c=12}$

$a = 12\sin 40^\circ$

Ex x?



$\sin 35^\circ = \frac{18}{x+18}$

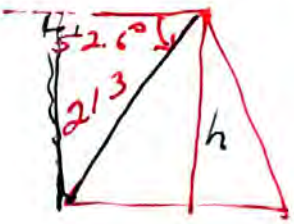
$x+18 = \frac{18}{\sin 35^\circ}$

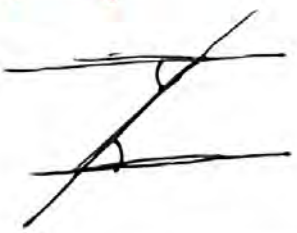
$x = \frac{18}{\sin 35^\circ} - 18$

Ex

$$\sin 52.6^\circ = \frac{h}{213}$$

$$h = 213 \sin 52.6^\circ$$





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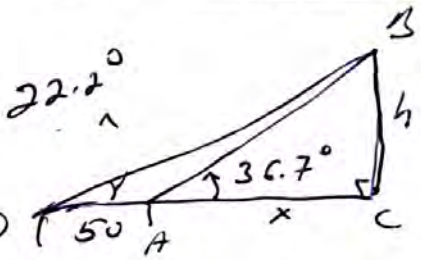
right triangle(s)

$$\triangle ABC \rightarrow \tan 36.7^\circ = \frac{h}{x} \quad (1)$$

$$\triangle DCB \rightarrow \tan 22.2^\circ = \frac{h}{x+50} \quad (2)$$



(1) $h = x \tan 36.7^\circ = (x+50)\tan 22.2^\circ$

$x \tan 36.7^\circ = x \tan 22.2^\circ + 50 \tan 22.2^\circ$

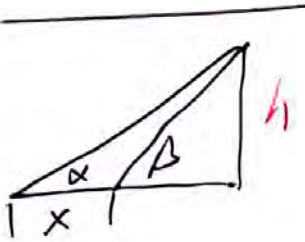
$x(\tan 36.7^\circ - \tan 22.2^\circ) = 50 \tan 22.2^\circ$

$$x = \frac{50 \tan 22.2^\circ}{\tan 36.7^\circ - \tan 22.2^\circ}$$

$$h = \overbrace{\frac{50 \tan 22.2^\circ}{\tan 36.7^\circ - \tan 22.2^\circ}}^{=x} \tan 36.7^\circ$$

$$= \frac{50 \tan 22.2^\circ \tan 36.7^\circ}{\tan 36.7^\circ - \tan 22.2^\circ}$$

$$h = \frac{x \tan\alpha \tan\beta}{\tan\beta - \tan\alpha}$$



#22

$$h = \frac{50 \tan 60^\circ \tan 45^\circ}{\tan 60^\circ - \tan 45^\circ}$$

$$= \frac{50\sqrt{3}\left(\frac{\sqrt{2}}{2}\right)}{\sqrt{3} - \frac{\sqrt{2}}{2}} = \frac{50\sqrt{6}}{2\sqrt{3} - \sqrt{2}}$$

$$= \frac{50\sqrt{6}}{2} \cdot \frac{1}{2\sqrt{3} - \sqrt{2}}$$

$$= \frac{50\sqrt{6}}{2\sqrt{3} - \sqrt{2}}$$

$$\tan 13^\circ = \frac{y}{x} \rightarrow y = x \tan 13^\circ$$

$$\tan 19^\circ = \frac{y}{25 - x} \rightarrow y = (25 - x)\tan 19^\circ$$

$$x \tan 13^\circ = 25 \tan 19^\circ - x \tan 19^\circ$$

$$x(\tan 13^\circ + \tan 19^\circ) = 25 \tan 19^\circ$$

$$x = \frac{25 \tan 19^\circ}{\tan 13^\circ + \tan 19^\circ}$$

$$y = \frac{25 \tan 19^\circ}{\tan 13^\circ + \tan 19^\circ} \tan 13^\circ$$

$$\approx 3.5 \text{ mi}$$

$\sqrt{3} \approx$

1.73205

3) 1 x 1

1

200 — 27 x 7 — 1 x 2

189

1100 — 343 x 3 — 17 x 2

1029

7100 — 3462 x 2

6924

17600 — 34644 x

17320 — 346405 x 5

25

$\sqrt{667}$

25.82

667) 2x2

4

267 — 45 x 5

225

4200 — 508 x 8

4064

13600 — 5162 x 2

10324