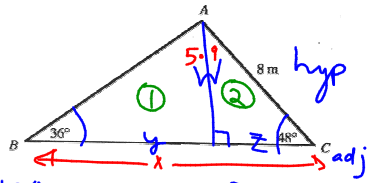
8.4 Solving Problems Involving Multiple Right Triangles

Example #1:
An engineer is required to make roof trusses with one angle being 36 ^{0} and the other being 48^0. How wide is the span of the trusses (BC)?



$\sin 48° = \frac{w}{8}$ $\cos 48° = \frac{z}{8}$

$\sin 48°(8) = w$ $\cos 48°(8) = z$

$w = 5.9m$ $z = 5.4m$

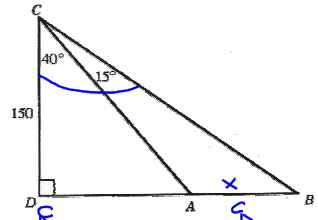
$\tan 36° = \frac{5.9}{y}$ $x = y + z$

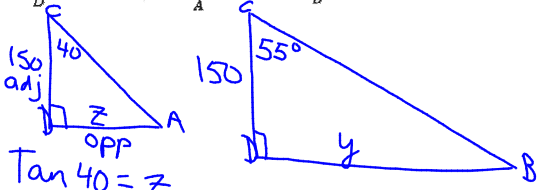
$y = \frac{5.9}{\tan 36}$ $x = 8.1 + 5.4$

$y = 8.1m$ $x = 13.5m$

Dec 18-3:05 PM

Example #2:
Determine the distance from A to B.





$\tan 40 = \frac{z}{150}$ $\tan 55 = \frac{y}{150}$

$z = \tan 40(150)$ $y = 214.2$ units

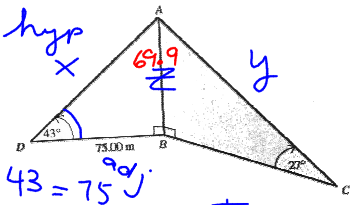
$z = 125.9$ units

$214.2 - 125.9$

88.3 units

Dec 18-3:10 PM

Example #3:
Two right triangles have side AB in common.
Determine the length of AD and AC



hyp
x
69.9
z
y

$\cos 43 = \frac{75}{x}$ adj

$x = \frac{75}{\cos 43}$

$x = 102.5\text{ m}$

$\tan 43 = \frac{z}{75}$

$z = \tan(43) \times 75$

$z = 69.9$

$\sin 27° = \frac{69.9}{y}$

$y = \frac{69.9}{\sin 27}$

$y = 154.0\text{ m}$

Dec 18-3:13 PM

Pg. 484

1, 2 odds

4, 5, 9, 10

Dec 18-1:54 PM