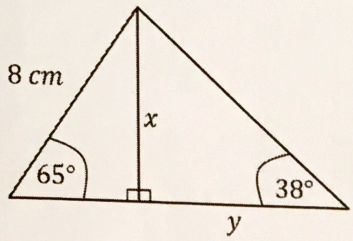
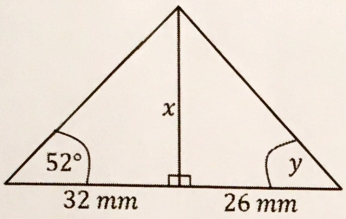
Multi-Step Trigonometry Problems

Find the missing lengths and angles in these diagrams.

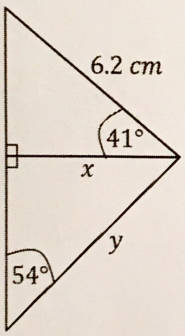
(a)



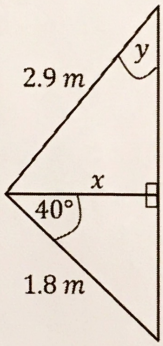
(b)



(c)



(d)



(a) $\sin 65 = \frac{x}{8}$ $x = 7.25\text{cm}$

$\tan 38 = \frac{7.25}{y}$ $y = 9.28\text{cm}$

(b) $\tan 52 = \frac{x}{32}$ $x = 40.96\text{mm}$

$\tan y = \frac{40.96}{26}$ $y = 57.6°$

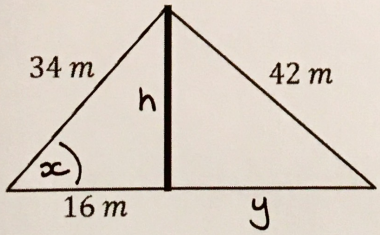
(c) $\cos 41 = \frac{x}{6.2}$ $x = 4.68\text{cm}$

$\sin 54 = \frac{4.68}{y}$ $y = 5.78\text{cm}$

(d) $\cos 40 = \frac{x}{1.8}$ $x = 1.38\text{m}$

$\sin y = \frac{1.38}{2.9}$ $y = 28.4°$

A vertical mast is held in position by two cables of lengths 34 m and 42m, as shown in the diagram.



(a) Calculate the height of the mast.
(b) Calculate the angle the horizontal makes with the 34 m cable.
(c) Calculate the horizontal distance from the foot of the mast to the 42 m cable.

$h = \sqrt{34^2 - 16^2} = 30\text{ m}$

$\cos x = \frac{16}{34}$ $x = 61.9°$

$y = \sqrt{42^2 - 30^2}$ $y = 29.4\text{m}$