Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

a ← unknown

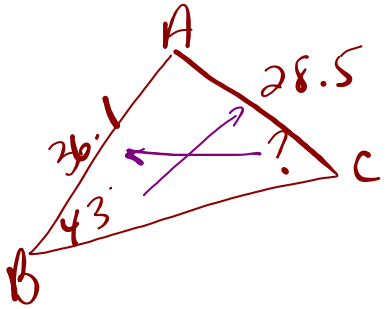
← Find a side

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$\sin A$ ← unknown

← Find an angle

HW ??? from 10.9



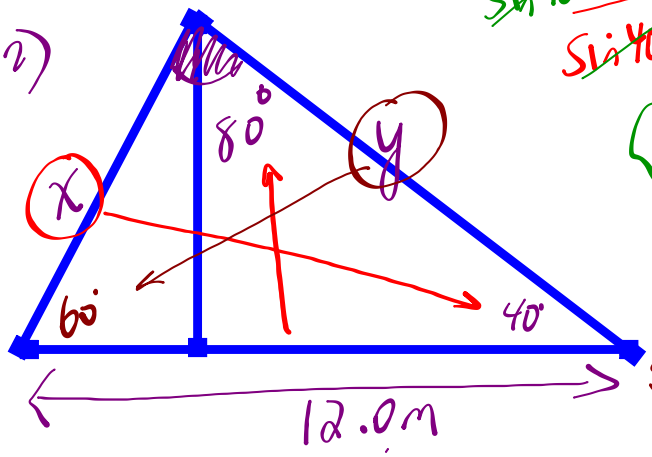
$\frac{\sin C}{36.1} = \frac{\sin 43}{28.5}$

$\sin^{-1}\sin C = \sin^{-1}(0.8639)$

$\angle C = 60$

10.10

2)



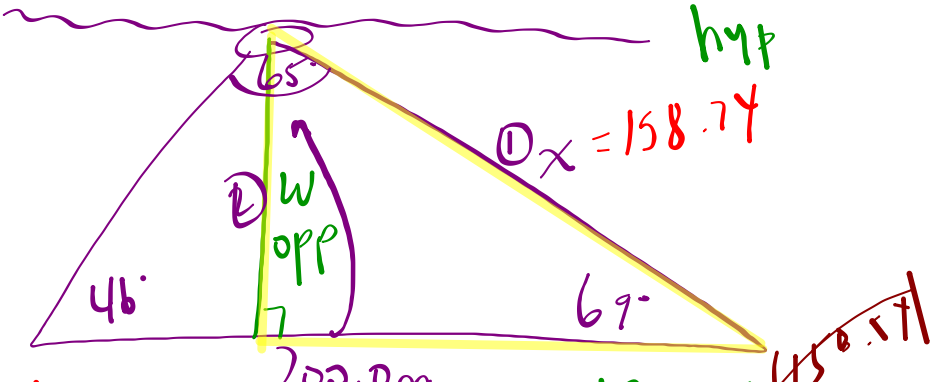
$\frac{x}{\sin 40} = \frac{12 \sin 40}{\sin 80}$

$x = 7.93\text{m}$

$\frac{y}{\sin 60} = \frac{12 \sin 60}{\sin 80}$

$y = 10.55\text{m}$

3)



hyp

① $x = 158.74$

① $\frac{x}{\sin 46} = \frac{200 \sin 46}{\sin 65}$

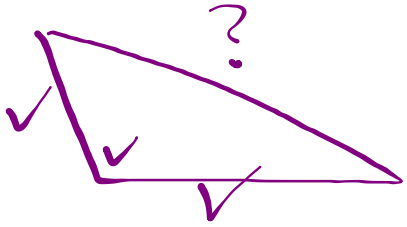
$x = 158.74$

② $\frac{W}{158.74} = \sin 69$

$W = 158.74 \sin 69$

$148.2\text{m} = W$

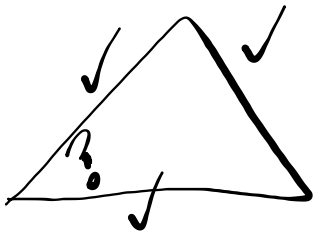
SAS $a^2 = b^2 + c^2 - 2bc\cos A$ Find a side



$\frac{2bc\cos A}{2bc} = \frac{b^2 + c^2 - a^2}{2bc}$

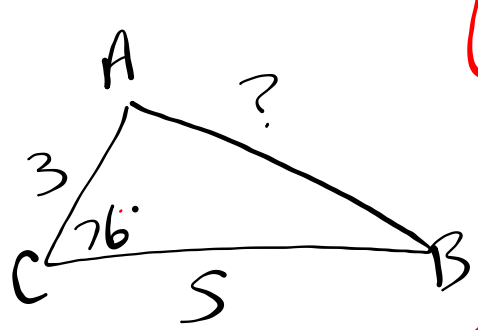
$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Find an angle (SSS)



10.11

1a)



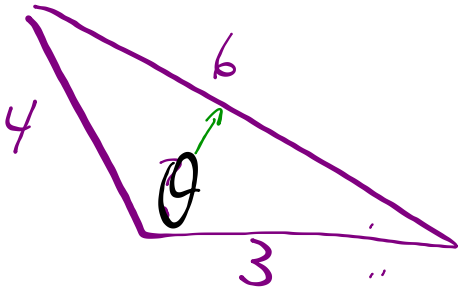
$a^2 = b^2 + c^2 - 2bc\cos A$

$c^2 = 3^2 + 5^2 - 2(3)(5)\cos 76°$

$c^2 = 76.74$

$c = 5.2$

2b)



$\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

$\cos\theta = \dfrac{4^2 + 3^2 - 6^2}{2(4)(3)}$

$\cos^{-1}\cos\theta = \cos^{-1}\left(\dfrac{-11}{24}\right)$

$\theta = 117°$

Example #2:

From T, a golfer aims a ball towards the hole at H which is 100m away. But the ball actually sliced in a direction 30^0 off course and lands at M, 60m away. If the next shot is hit 50 m towards the hole, will the ball go in the hole?

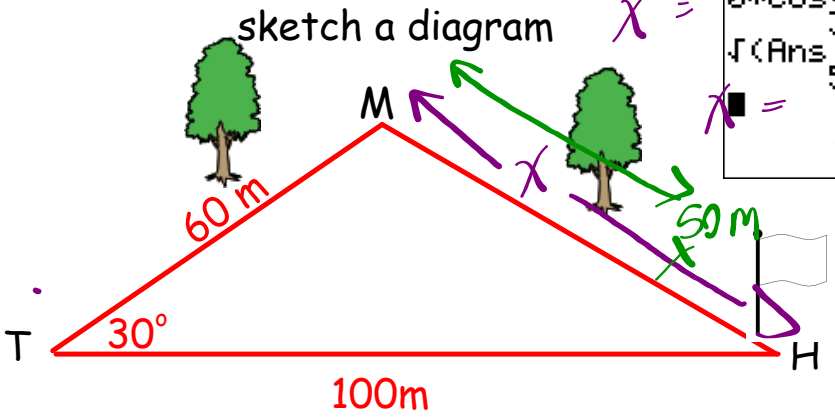
$x^2 = 60^2 + 100^2 - 2(60)(100)\cos 30°$

$x^2 =$

```
60²+100²-2*60*10
0*cos(30)
      3207.695155
√(Ans
      56.63651785
```

$x =$

$x = 56.6\text{ m}$



No, we will be 6.6m short

Homework...

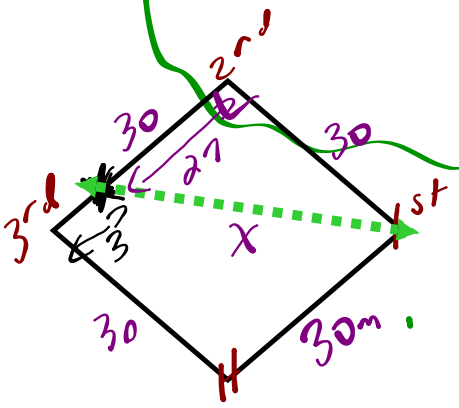
Worksheet - Law of Cosines.doc

Revisit 10.11 → Law of Cosine Skills

10.12 → #1 (perimeter add all sides)

#2-6

#4.



Attachments

Worksheet - Law of Cosines.doc