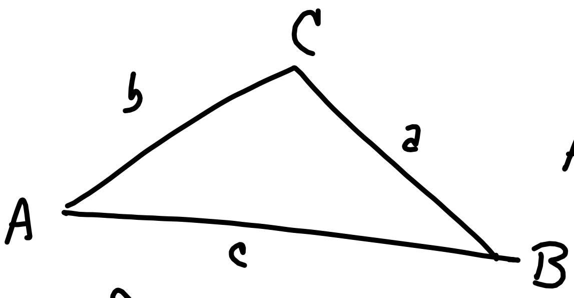
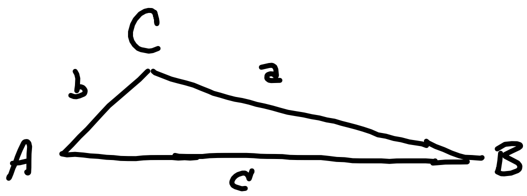
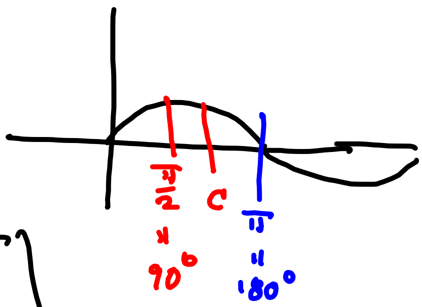




Law of Sines:

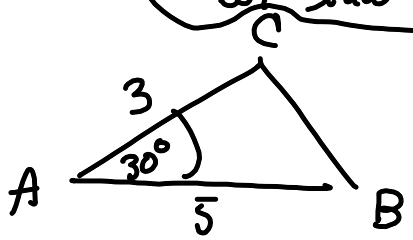
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



$\boxed{\text{ASS}}$

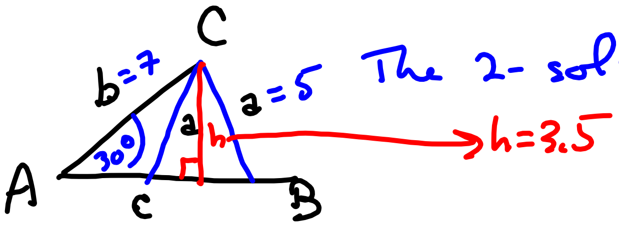
Law of Cosines

SAS is enough to solve the triangle w/ law of sines.



$$\frac{\sin A}{a} =$$

ASS: May be solvable, may have one solution, may have 2 sol'ns.

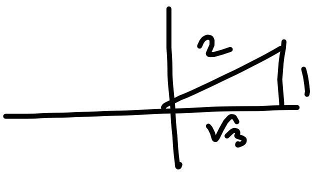


The 2- sol'n case.

$$\frac{\sin 30^\circ}{5} = \frac{\sin B}{7}$$ if I built this right.

How do we know if this'll work?

Find h:



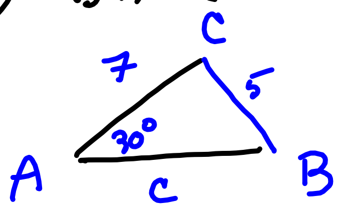
$$\frac{h}{7} = \sin 30^\circ$$

$$h = 7 \sin 30^\circ = 7\left(\tfrac{1}{2}\right) = 3.5$$

since $h = 3.5 < c = 5 < 7 = b$

So 2 possibilities.

(I) B is acute



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

$$\frac{\sin 30^\circ}{5} = \frac{\sin B}{7}$$

$$\sin B = \frac{7\sin 30^\circ}{5} = .7$$

```
sin⁻¹(.7)
        44.42700400
180-30-Ans
        105.5729960
10sin(Ans)
        9.632892041
```

$$\Rightarrow B = \sin^{-1}(.7) \approx \boxed{44.42700400^\circ \approx B}$$

```
         .700000000
sin⁻¹(Ans)
        44.42700400
180-30-Ans
        105.5729960
14*sin(Ans)
        13.48604886
```

$$\Rightarrow C = 180^\circ - 30^\circ - 44.4\ldots^\circ$$

$$\approx \boxed{105.5729960^\circ \approx C}$$

$$\Rightarrow \frac{c}{\sin(105.\ldots^\circ)} \approx \frac{5}{\frac{1}{2}} = \frac{a}{\sin A} = 10$$

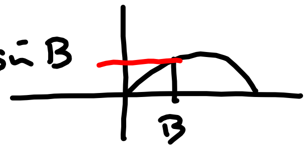
$$c = 10\sin(105.\ldots^\circ) \approx \boxed{9.632892041 \approx c}$$

```
         .700000000
sin⁻¹(Ans)
        44.42700400
180-30-Ans
        105.5729960
14*sin(Ans)
        13.48604886
```

II

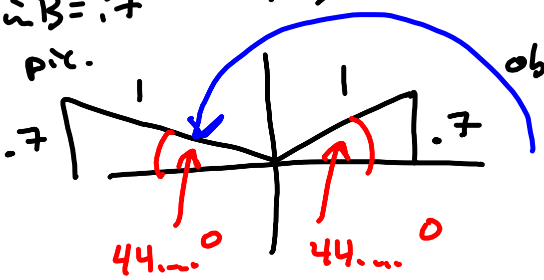
B is acute

$.7 = \sin B$

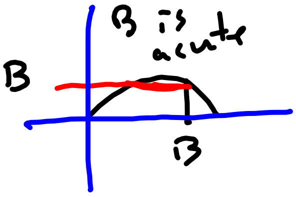


$\sin B = .7$

pic.



$.7 = \sin B$



obtuse B

$= 180° - \text{acute } B.$

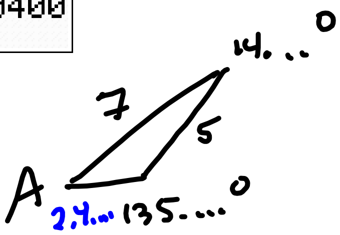
$= 180° - 44\ldots°$

$\approx 135.5729960°$

```
14*sin(Ans)
      13.48604886
180-sin⁻¹(7sin(30
)/5)
      135.5729960
180-30-Ans
      14.42700400
```

$\Rightarrow C = 180 - 30 - B$

$\boxed{\approx 14.42700400° \approx C}$



$$\frac{c}{\sin C} = \frac{5}{\frac{1}{2}} = \frac{a}{\sin A} = 10$$

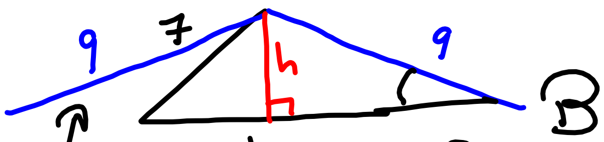
```
180-sin⁻¹(7sin(30
)/5)
      135.5729960
180-30-Ans
      14.42700400
10sin(Ans
      2.491463612
```

$c = 10 \sin C$

$\approx 10 \sin 14\ldots°$

$\boxed{\approx 2.491463612 \approx c}$

Note: If $c > b$, e.g. $c = 9$ This one has just ONE possible arrangement.



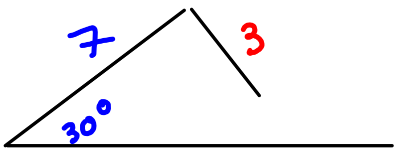
Impossible!

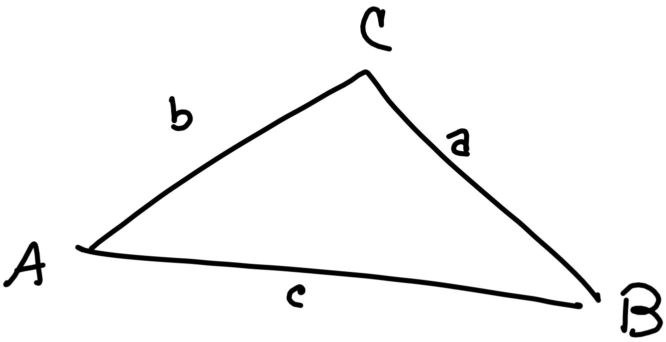
So B is acute

No Solutions case.

$h = 7 \sin 30^\circ = 3.5$

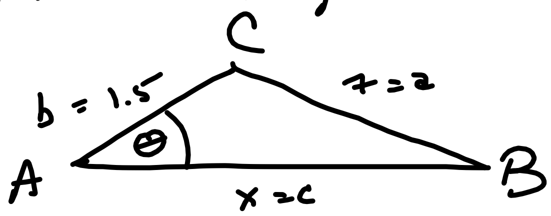
& $a < 3.5$ can't touch ground.





$$c^2 = a^2 + b^2 - 2ab\cos C$$

§ 3.2 #56 I got it wrong.



$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$x^2 = 7^2 + (1.5)^2 - 2(7)(1.5)\cos C$$

Need something involving θ

· In terms of θ:

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

$$7^2 = (1.5)^2 + x^2 - 2(1.5)x\cos\theta$$

$$49 = 2.25 + x^2 - 3x\cos\theta$$

The question wants $x = x(\theta)$

$x^2 - 3(\cos\theta)x + 2.25 - 49 = 0$

$x^2 - (3\cos\theta)x - 46.75 = 0$

$a = 1,\ b = 3\cos\theta,\ c = -46.75$

```
4*46.75
        187.0000000
```

$b^2 - 4ac = 9\cos^2\theta - 4(1)(-46.75)$

$= 9\cos^2\theta + 187$

$$x = \frac{-3\cos\theta \pm \sqrt{9\cos^2\theta + 187}}{2}$$

$$\Rightarrow \boxed{x = \frac{-3\cos\theta + \sqrt{9\cos^2\theta + 187}}{2}}$$

$(3\cos\theta)^2 = 3^2(\cos\theta)^2$