

Solutions: 6.4 (odd-numbered problems)

11. From the information, we know that $\angle B = 85^\circ$. So, by the Law of Sines,

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

so

$$a = \frac{\sin B}{b} \sin A = \frac{\sin 85}{10} \sin 30$$

Again, by the Law of Sines,

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

so

$$c = \frac{\sin B}{b} \sin C = \frac{\sin 85}{10} \sin 65$$

17. This triangle does not exist - the longest side must be across the longest angle, which does not happen here.

23. Well, the angle $\angle ACB = 46^\circ$, so we can use the Law of Sines:

$$\frac{\sin 46}{200} = \frac{\sin 52}{AC}$$

and so

$$AC = \frac{200}{\sin 46} \sin 52 \approx 219.093$$

27. From the information given, the angle θ opposite the guy wire is 136° and the other angle is 32° (why?). Now we can use the Law of Sines to find the length of the guy wire, which we will call G :

$$\frac{\sin 32}{100} = \frac{\sin 136}{G}$$

so

$$G = \frac{100}{\sin 32} \sin 136 \approx 131.088$$