

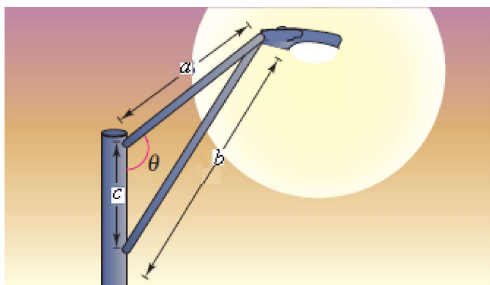
## Statics Summer Assignment

Show all work to justify your answer. All answers should be exact (*no decimal answers unless it is specified*).

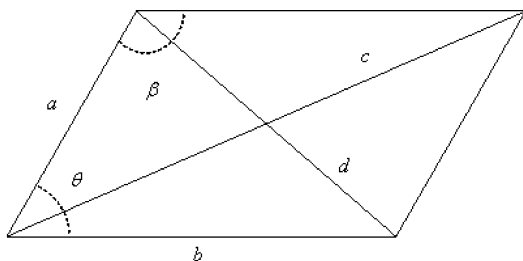
1. Find values for  $b$  such that the triangle has two solutions.  $A = 20^\circ$ ,  $a = 7$

2. Determine the angle  $\theta$  in the design of the streetlight shown in the following figure.

$$a = 4, b = 5\frac{1}{2}, c = 3$$



3. In the figure below,  $a = 8$ ,  $b = 11$ , and  $d = 12$ . Use this information to solve the parallelogram for  $\beta$ . The diagonals of the parallelogram are represented by  $c$  and  $d$ . Round answer to two decimal places.



*figure not drawn to scale*

4. Use the Law of Sines to solve (if possible) the triangle. Round your answers to two decimal places.

$$A = 120^\circ, a = b = 42$$

5. Given  $\mathbf{u} = \langle 6, 12 \rangle$  and  $\mathbf{v} = \langle 3, -12 \rangle$ , find  $2\mathbf{u} + 5\mathbf{v}$ .

6. Find the vector  $\mathbf{v}$  whose initial and terminal points are given below.  
 $(5, 5)$ ,  $(7, 2)$

7. Find the component form of vector  $\mathbf{u} + \mathbf{v}$  given  $|\mathbf{u}| = 2$  and  $|\mathbf{v}| = 3$  and the angles that  $\mathbf{u}$  and  $\mathbf{v}$  make with the positive  $x$ -axis are  $\theta_u = 0^\circ$  and  $\theta_v = 45^\circ$ .

8. Determine all the angles in the truss:

