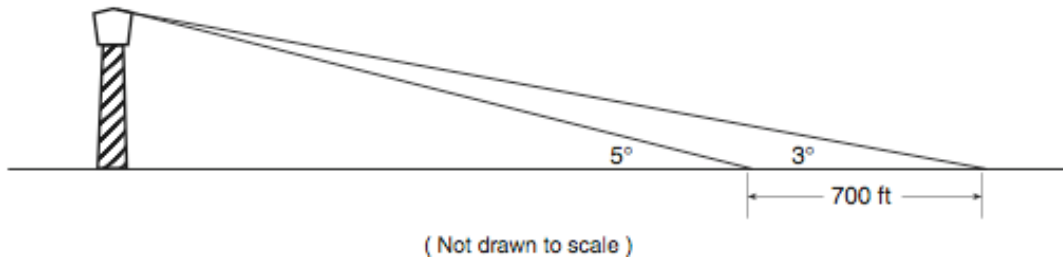


1. While sailing a boat offshore, Donna sees a lighthouse and calculates that the angle of elevation to the top of the lighthouse is  $3^\circ$ , as shown in the accompanying diagram. When she sails her boat 700 feet closer to the lighthouse, she finds that the angle of elevation is now  $5^\circ$ . How tall, to the *nearest tenth of a foot*, is the lighthouse?



1.

2. The Vietnam Veterans Memorial in Washington, D.C. is made up of two walls, each 246.75 feet long, that meet at an angle of  $125.2^\circ$ . Find, to the *nearest foot*, the distance between the ends of the walls that do not meet.

2.

3. A restaurant is located at the intersection between Walker Street and Throop Street. Heather's house is on Walker Street and it is 2.6 miles from the restaurant. Patricia's house is on Throop Street and it is 4.3 miles from the restaurant. The distance between Heather's house and Patricia's house is 3.6 miles. What angle is made by the intersection between Walker Street and Throop Street? *Round your answer to the nearest tenth of a degree.*

3.

4. A box contains one 2-inch rod, one 3-inch rod, one 4-inch rod, and one 5-inch rod. What is the maximum number of different triangles that can be made using these rods as sides?

- (1) 1                      (3) 3  
 (2) 2                      (4) 4

5. Which statement is *not* valid for proving that two triangles are congruent?

- (1) SAS  $\cong$  SAS      (3) ASA  $\cong$  ASA  
 (2) SSA  $\cong$  SSA      (4) AAS  $\cong$  AAS

4.

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5.

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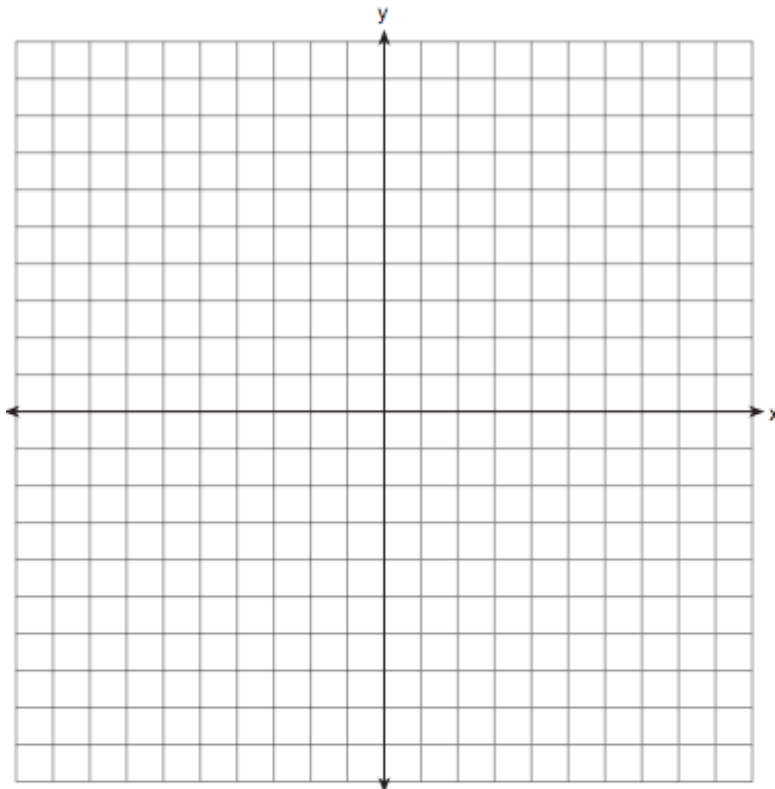
6. Find, to the *nearest degree*, all values of  $\theta$  in the interval  $0^\circ \leq \theta < 180^\circ$  that satisfy the equation  $3 \tan^2 \theta + \frac{1}{\cot \theta} = 2$ .

6.

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7. On the set of axes below, sketch and label the graphs of  $f(x) = \sin(x - \pi)$ ,  $g(x) = \sin x$ , and  $h(x) = 2 \cos x$  on the interval  $-2\pi \leq x \leq 2\pi$

- a) State *two* different transformations that can be applied to  $g$  so that its image is  $f$ .  
 b) From your graphs, determine the number of solutions to the equation  $2 \cos x = \sin(x - \pi)$  that exist on the interval  $-2\pi \leq x \leq 2\pi$ .



7.

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