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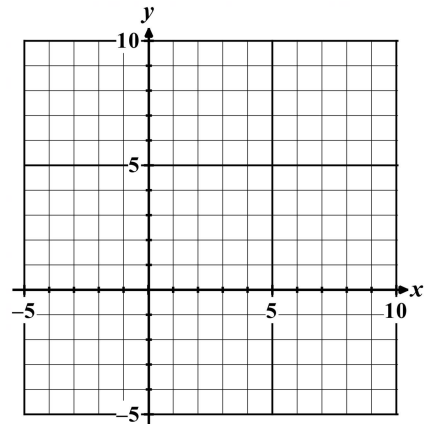
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**MORE APPLICATIONS OF TRIGONOMETRY**  
**N-GEN MATH® GEOMETRY**



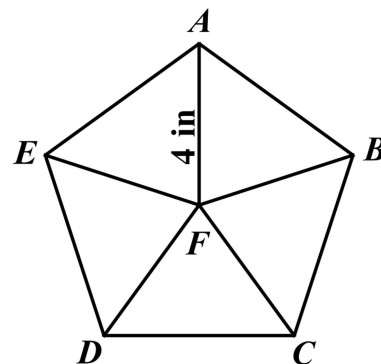
*Right triangle trigonometry can arise in many different contexts because right triangles are so important in both geometry and in real-world scenarios.*

**Exercise #1:** Parallelogram  $ABCD$  has vertices at  $A(1, 4)$ ,  $B(9, 4)$ ,  $C(4, -3)$ , and  $D(-4, -3)$ . Find the measure of one of its larger angles to the nearest degree.



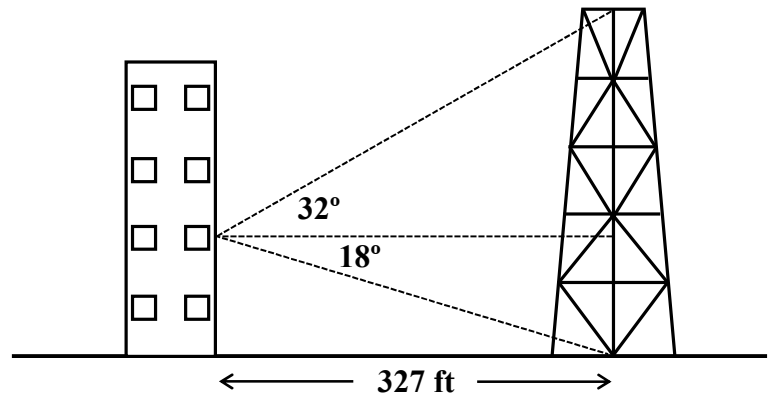
**Exercise #2:** In rhombus  $DEFG$ , the common side length is 18 inches, and the smaller interior angle has a measure of  $68^\circ$ . What is the length of its longer diagonal to the nearest tenth of an inch?

**Exercise #3:** In regular pentagon  $ABCDE$ , point  $F$  is located on the interior of the polygon at its center. If the length of  $\overline{AF}$  is 4 inches, then determine if the perimeter of  $ABCDE$  is greater than 2 feet.

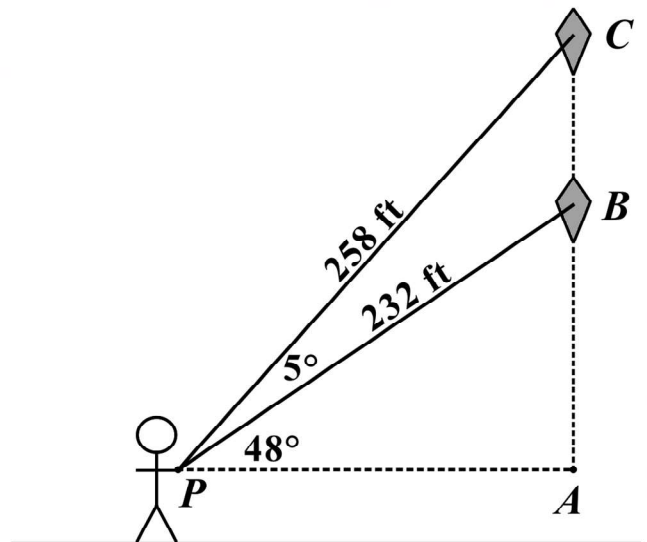


There are certainly times in a problem when you will need to use more than one trigonometric ratio in order to find a final answer.

**Exercise #4:** A tower is located 327 feet from a building in the figure shown below. A person from the second story measures an angle of elevation to the top of the tower as  $32^\circ$  and an angle of depression to the bottom of the tower as  $18^\circ$ . Find the height of the tower to the nearest tenth of a foot.



**Exercise #5:** A person flying a kite originally lets out 232 feet of line. At this point the person observes an angle of elevation to the kite of  $48^\circ$ . The person then lets out additional line for a total of 258 feet, which increases the angle of elevation by  $5^\circ$ . If the kite only rises vertically between the two points in time as shown, determine, to the nearest foot, how much higher the kite is as point  $C$  than at point  $B$ .



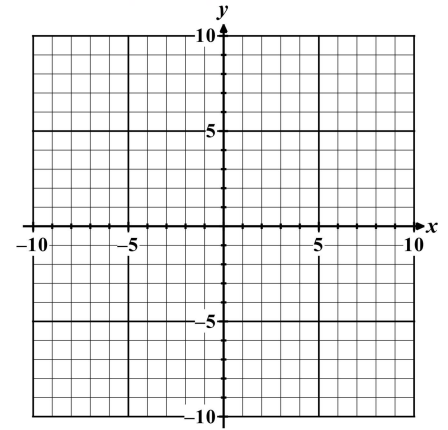
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**MORE APPLICATIONS OF TRIGONOMETRY**  
**N-GEN MATH® GEOMETRY HOMEWORK**

**APPLICATIONS**

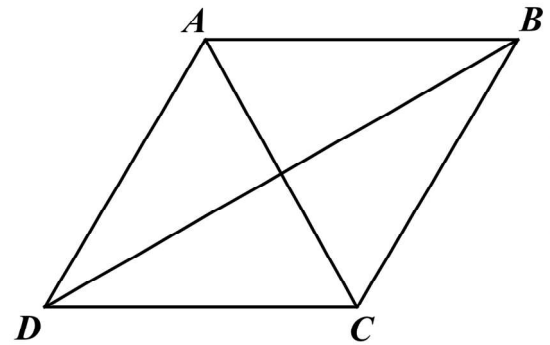
1. Triangle  $ABC$  has vertices at  $A(-6, 4)$ ,  $B(8, 1)$ , and  $C(-2, -4)$ .
- (a) Determine the slopes of  $\overline{AC}$  and  $\overline{BC}$ . Explain why these slopes show that  $\triangle ABC$  is a right triangle.



- (b) Using the distance formula, find the lengths of  $\overline{AC}$  and  $\overline{BC}$  in simplest radical form.

- (c) Determine the measure of  $\angle B$  to the nearest degree. Show how you found your answer.

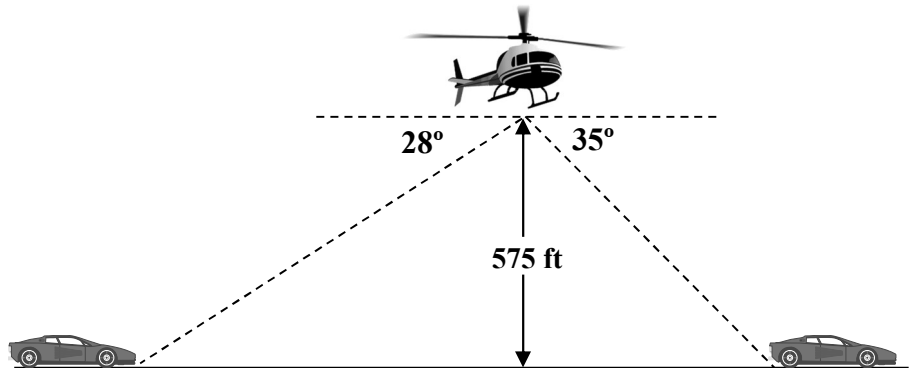
2. In rhombus  $ABCD$  shown,  $AB = 17$  and  $AC = 16$ .
- (a) Find the length of  $\overline{BD}$  without using trigonometry.



- (b) Find the measure of  $\angle ABC$  to the nearest degree.



3. A helicopter is flying at an elevation of 575 feet directly above a horizontal highway. Two motorists are driving cars on the highway. The angle of depression to one car is  $28^\circ$  and the angle of depression to the other car is  $35^\circ$ . How far apart are the cars to the *nearest foot*?



4. A boat is trying to determine its speed, in feet per minute. The boat spots a 245-foot-tall lighthouse at point  $A$  at an angle of elevation of  $12^\circ$ . Five minutes later it arrives at point  $B$  after traveling in a straight line towards the light house. The angle of elevation is now  $28^\circ$ . What is the boat's speed to the nearest foot per minute?

