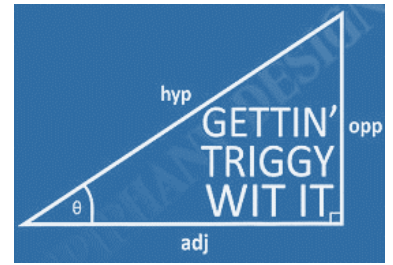


Name: \_\_\_\_\_ Date: \_\_\_\_\_



## Right triangle problem solving U6D3 Applications

**SHOW ALL WORK TO SUPPORT YOUR ANSWERS!!!!!!**

**Draw diagrams to help yourself!!!!!!**

1) In  $\triangle ABC$ , where  $\angle C$  is a right angle,  $\cos A = \frac{\sqrt{21}}{5}$ . What is  $\sin B$ ?

(1)  $\frac{\sqrt{21}}{5}$

(3)  $\frac{2}{5}$

(2)  $\frac{\sqrt{21}}{2}$

(4)  $\frac{5}{\sqrt{21}}$

2) In  $\triangle ABC$ , the complement of  $\angle B$  is  $\angle A$ . Which statement is always true?

(1)  $\tan \angle A = \tan \angle B$

(3)  $\cos \angle A = \tan \angle B$

(2)  $\sin \angle A = \sin \angle B$

(4)  $\sin \angle A = \cos \angle B$

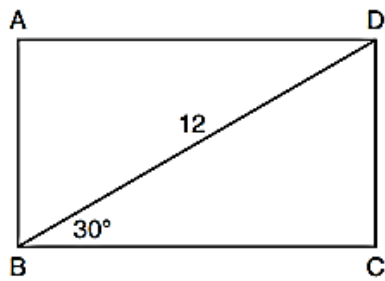
3) If  $\cos(2x - 1)^\circ = \sin(3x + 6)^\circ$ , then find the value of  $x$ .

4) Find the value of  $R$  that will make the equation  $\sin 73^\circ \cos R$  true when  $0^\circ < R < 90^\circ$ . Explain your answer.

5) A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the *nearest tenth of a degree*?



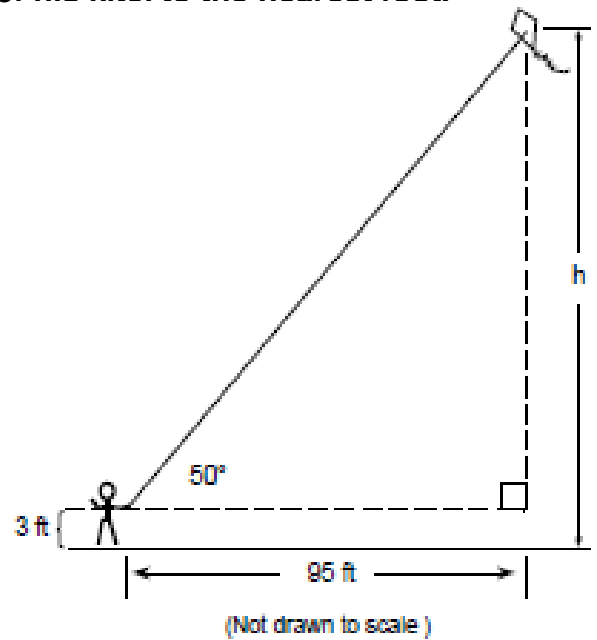
- 10) The diagram shows rectangle  $ABCD$ , with diagonal  $\overline{BD}$ .



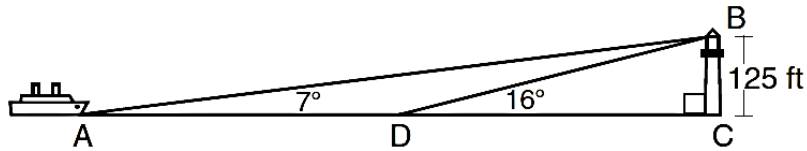
What is the perimeter of rectangle  $ABCD$ , to the *nearest tenth*?

- (1) 28.4                      (3) 48.0  
(2) 32.8                      (4) 62.4

- 11) Ruby is holding her kite string 3 feet above the ground, as shown in the accompanying diagram. The distance between her hand and a point directly under the kite is 95 feet. If the angle of elevation to the kite is  $50^\circ$ , **find the height,  $h$ , of his kite. to the *nearest foot*.**

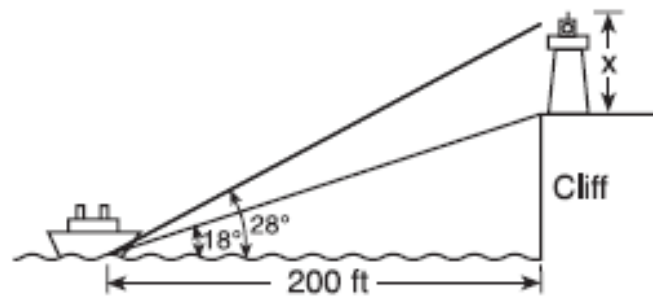


- 12) As shown in the diagram below, a ship is heading directly toward a lighthouse whose beacon is 125 feet above sea level. At the first sighting, point  $A$ , the angle of elevation from the ship to the light was  $7^\circ$ . A short time later, at point  $D$ , the angle of elevation was  $16^\circ$ .



To the *nearest foot*, determine and state how far the ship traveled from point  $A$  to point  $D$ .

- 13) A lighthouse is built on the edge of a cliff near the ocean, as shown in the accompanying diagram. From a boat located 200 feet from the base of the cliff, the angle of elevation to the top of the cliff is  $18^\circ$  and the angle of elevation to the top of the lighthouse is  $28^\circ$ . **What is the height of the lighthouse,  $x$ , to the nearest tenth of a foot?**



- 14) Freda, who is training to use a radar system, detects an airplane flying at a constant speed and heading in a straight line to pass directly over her location. She sees the airplane at an angle of elevation of  $15^\circ$  and notes that it is maintaining a constant altitude of 6250 feet. One minute later, she sees the airplane at an angle of elevation of  $52^\circ$ . How far has the airplane traveled, to the *nearest foot*?

Determine and state the speed of the airplane, to the *nearest mile per hour*.