Hon Pre-Calculus Test Chapter 6 2017 - 2018

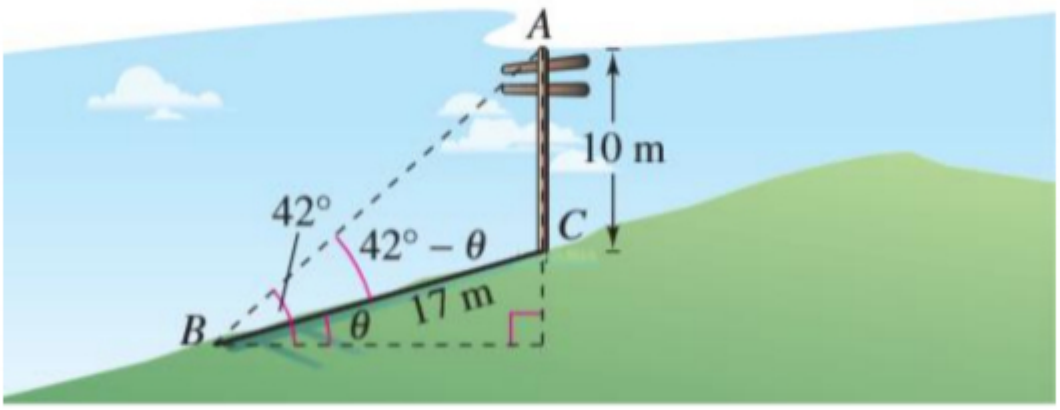
1. Solve the triangle: (Find all possible missing values)

   $A = 58°$, $a = 11.4$, $b = 12.8$
   $B = ??$
   $C = ??$
   $c = ??$

2. Find the area of the triangle having the indicated angle and sides:

   $A = 5°15'$, $b = 4.5$, $c = 22$

3. A 10 meter utility pole casts a 17 meter shadow directly down a slope when the angle of elevation of the sun is 42° (see figure), Find θ, the angle of elevation of the ground.



4. On a baseball diamond with 90 foot base paths (sides), the pitcher mound is 60 feet 6 inches from home plate and sits equidistant from first and third base..

   a) How far is it to first base from the pitcher mound?

   b) Find the bearing of the pitcher mound to first base

5. Two ships leave a port at 9:00A.M. One travels at a bearing of N 53° W at 12 miles per hour, and the other travels at a bearing of S 67° W at 16 miles per hour. Approximately, how far apart are they at noon that day?

6. Find the magnitude and direction of the resultant vector $\vec{u} + \vec{v}$ if $||u|| = 50$, $||v|| = 30$, $\theta_u = 30°$, and $\theta_v = 110°$

7. Find the **exact** terminal point of a vector with a magnitude of 6, that has the same direction as $\langle -2, 2\sqrt{3} \rangle$, and has an initial point of (-3,2)

8. Find the unit vector in the same direction as $\langle -5, 12 \rangle$

9. Find the angle between <3, 2> and <4, 0>

10. Find $\vec{u} \cdot \vec{v}$ **exactly**, where θ is the angle between $\vec{v}$ and $\vec{v}$

$||\vec{u}|| = 100$, $||\vec{v}|| = 250$, $\theta = \frac{\pi}{6}$

11. Determine whether $\vec{u}$ and $\vec{v}$ are parallel, orthogonal, or neither.

a) $\vec{u} = \langle -12, 30 \rangle$
$\vec{v} = \langle \frac{1}{2}, -\frac{5}{4} \rangle$

b) $\vec{u} = 2i - 2j$
$\vec{v} = -i - j$

12. If $\vec{u} = \langle 6, -3 \rangle$, find all possible components of $\vec{v}$ such that $\vec{u}$ and $\vec{v}$ are orthogonal and $||\vec{v}|| = 10$

13. Three forces with magnitudes of 75 pounds, 100 pounds and 125 pounds act on an object at angles of 30°, 45°, and 120°, respectively, with the positive x-axis. Find the direction and magnitude of the resultant of these forces.

a) Magnitude =

b) Direction =

14. What is the trigonometric form of -8+3i ?

15. Find the indicated power of the complex number: $2(\sqrt{3}+i)^{10}$

16. Find all the fifth roots of -32i in ***POLAR*** form.

17. Find the ***exact*** values in complex form of all the fourth roots of $8+8\sqrt{3}\,i$

18. (*** Bonus ***) Find all ***exact*** solutions in ***complex form*** to the equation $x^4 = i$.