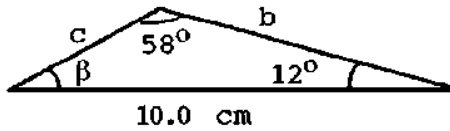


MAC 1114 Practice Test #4 Chapters 7-8

1. Solve the triangle:



Answer:  $\beta = 110^\circ$ ,  $b = 11.1\text{cm}$ ,  $c = 2.45\text{cm}$

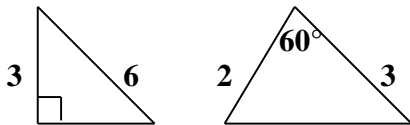
2. A triangle has sides of sides 12, 9, and 5 feet. Find the degree measure of the largest angle in the triangle. Give your answer to one decimal place.

Answer:  $115.0^\circ$

3. Find the degree measure of the angle  $\alpha$  (to the nearest degree) opposite the side  $a$  in the triangle with sides  $a = 10.0$ ,  $b = 5.0$ ,  $c = 7.0$ .

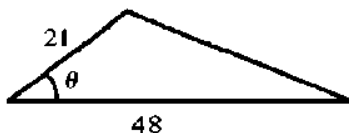
Answer:  $\alpha = 112^\circ$

4. Find the area of the Following triangles



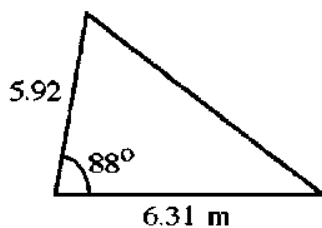
Answer:  $9\sqrt{3}/2$ ;  $3\sqrt{3}/2$

5. The area of the pictured triangle is 252 square meters. Find the angle  $\theta$ .



Answer:  $30^\circ$

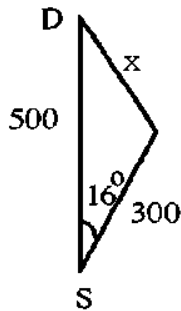
6. Find the area of the triangle pictured below.



Answer:  $18.7\text{ m}^2$

7. A pilot is flying from Salt Lake City to Denver, a distance of about 500 miles. After 2 hours of flying at 150 mph, she discovers that she has been flying  $16^\circ$  off course. How far is she from Denver at this time?

Answer: 227 miles



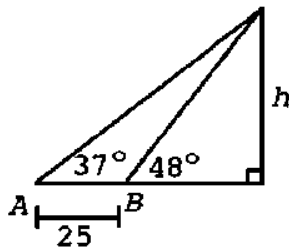
8. Two forces have an angle of  $105^\circ$  between them.  $F_1$  has magnitude 400 N and  $F_2$  has magnitude 250 N. Find the magnitude of the resultant force  $F_1 + F_2$ .

Answer:  $F_1 + F_2 \approx 413$  N

9. A pilot wishes to fly due north. The plane's air speed is 310 km/hr. The wind is blowing towards a compass heading of  $38^\circ$  (measured clockwise from north) with a speed of 55 km/hr. Find the compass heading at which the pilot needs to fly and the resultant ground speed of the plane.

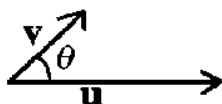
Answer:  $353.7^\circ$ ; 351km/hr.

10. From one point on the ground, the angle of elevation to the top of a tree is measured at  $37^\circ$ . From another point 25 feet closer, the angle of elevation is  $48^\circ$ . Use Laws of Sine/Cosine to find how tall the tree is.



Answer: 58.6feet;

11. In the figure below,  $|u| = 11.4$  m/s,  $|v| = 8.15$  m/s, and  $\theta = 27^\circ 15'$ . Find  $|u + v|$  and the angle with  $u$ .



Answer: 19.0 m/s,  $11.8^\circ$

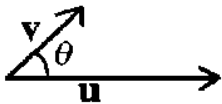
12. Find the position vector from A (-4, 1) to B (2, 5).

Answer:  $\langle 6, 4 \rangle$

13. If  $v = 9i - 2j$  is a vector, find  $|v|$

Answer:  $\sqrt{85}$ .

14. In the figure below,  $|u| = 11.4$  m/s,  $|v| = 8.15$  m/s, and  $\theta = 27^\circ 15'$ . Find  $|u + v|$  and the angle with  $u$ .



Answer: 19.0 m/s,  $11.8^\circ$

15. Point P has polar coordinates  $(20, 5\pi/3)$ . Find the rectangular coordinates for P.

16. Plot the points A  $(-3, 60^\circ)$  and B  $(2, 45^\circ)$  on a polar coordinate graph.

17. Point Q has rectangular coordinates  $(2, -2)$ . Give the exact polar coordinates  $(r, \theta)$  for Q with  $r \geq 0$  and  $0 \leq \theta < 2\pi$ .

18. Write the rectangular equation  $9xy = 2x^2$  in polar form.

Answer:  $\tan \theta = 2/9$

19. Sketch a graph of the polar equation  $r = 2\sec \theta$  by changing to Cartesian. Check graphically.

20. Sketch a graph of the polar equation  $r = 3\cos(2\theta)$ . Check graphically.

21. No-Calculator: How many petals do the rose  $r = 4\sin(3\theta)$  has?