MAC1114
Ref. #:__864611___
Fall 2015 (2015_1)
Final Exam

Name_____ Grade_____

Student ID_____ Date_____

SHORT ANSWER. Show ALL work NEATLY in the space provided, and write the final answer on the answer line. No credit will be given if work is not shown or is not legible.

Find the reference angle for the given angle.

1) 150°

1) _____

Solve.

2) A hot-air balloon exerts a 1100 lb pull **B** on a tether line at a 60° angle with the horizontal. Resolve the vector **B** into components.

2) _____

Solve, finding all solutions in $[0, 2\pi)$.

3) $\tan x \sin x - \tan x = 0$ 3) _____

Find a unit vector that has the same direction as the given vector.

4) $w = -7i + 6j$ 4) _____

Find the area of triangle.

5) $C = 48.3°$, $b = 71$ ft, $a = 12.7$ ft 5) _____
Round to the nearest tenth.

Solve, finding all solutions in $[0, 2\pi)$.

6) $5.6 \cos x + 2.8\sqrt{3} = 0$ 6) _____

Express the complex number in trigonometric form.

7) $6\sqrt{2} - 6\sqrt{2}i$ Express your answer in radians. 7) _____

Find the dot product, $\mathbf{u} \cdot \mathbf{v}$, for the given vectors.

8) $\mathbf{u} = \langle 10, -3 \rangle$, $\mathbf{v} = \langle -12, 11 \rangle$ 8) _____

Solve.

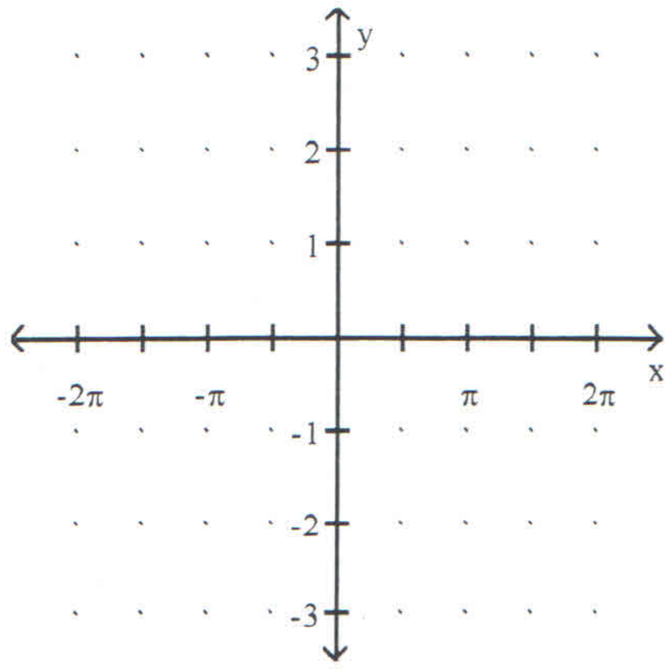
9) Two ships leave a harbor together traveling on courses that have an angle of 126° between them. If they each travel 531 miles, how far apart are they to the nearest mile? 9) _____

Find the angle between the given vectors, to the nearest tenth of a degree.

10) $\mathbf{a} = 7\mathbf{i} - 4\mathbf{j}$, $\mathbf{b} = 2\mathbf{i} - 9\mathbf{j}$ 10) _____

Use a graphing calculator to graph the function using the given viewing window parameters.

11) $y = 2 \cos x$ 11) _____



Find all the complex solutions of the equation.

12) $x^2 - i = 0$ 12) _____

Use trigonometric identities to find the exact value.

13) $\sin 23° \cos 22° + \cos 23° \sin 22°$

13) _____

Prove the identity.

14) $\ln |\csc x| = -\ln |\sin x|$

14) _____

Solve the equation for the interval $[0, 2\pi)$.

15) $2 \sin^2 x = \sin x$

15) _____

Determine the direction angle θ of the vector, to the nearest degree.

16) $\mathbf{v} = \langle -2, 8 \rangle$ 16) _____

Find the exact acute angle θ for the given function value.

17) $\cos\theta = \frac{\sqrt{2}}{2}$ 17) _____

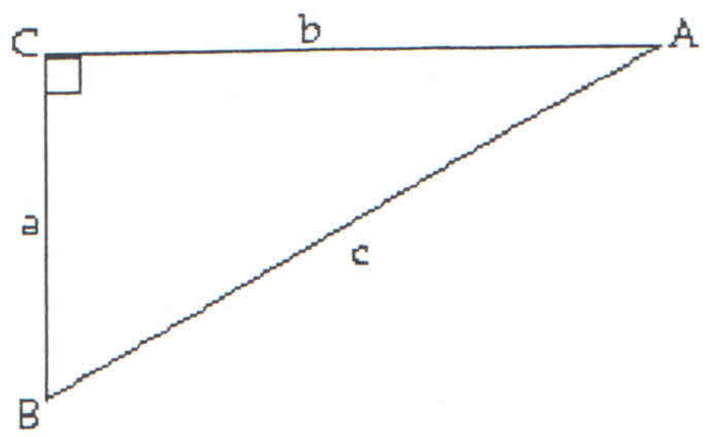
Find the supplement or complement.

18) Complement of $\frac{\pi}{12}$ 18) _____

Solve the right triangle for all missing sides and angles to the nearest tenth.

19) _____

19)



c = 22

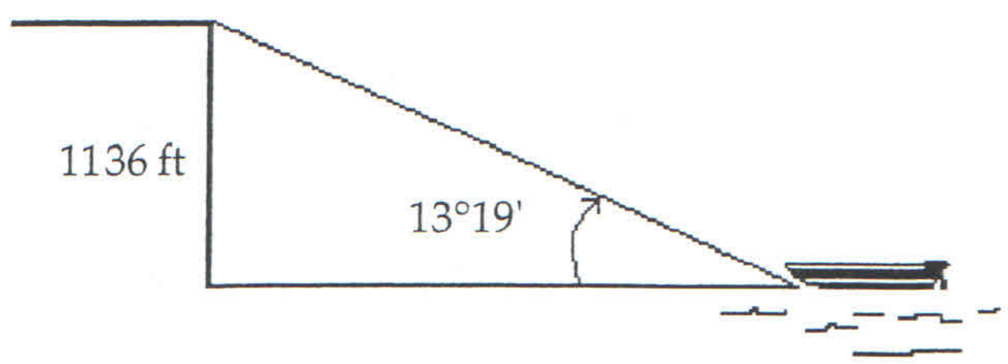
B = 62°

Solve.

20) A baseball player throws a baseball with a speed **S** of 76 mph at an angle of 45° with the horizontal. Resolve the vector **S** into components. 20) _____

21) From a boat on the river below a dam, the angle of elevation to the top of the dam is 13°19'. If the dam is 1136 feet above the level of the river, how far is the boat from the base of the dam (to the nearest foot)?

21) _____



1) 30°

2) Horizontal: 550 lb, vertical: 952.6 lb

3) $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$

4) $\frac{-7}{\sqrt{85}}\mathbf{i} + \frac{6}{\sqrt{85}}\mathbf{j}$

5) 336.6 ft^2

6) $\frac{5\pi}{6}, \frac{7\pi}{6}$

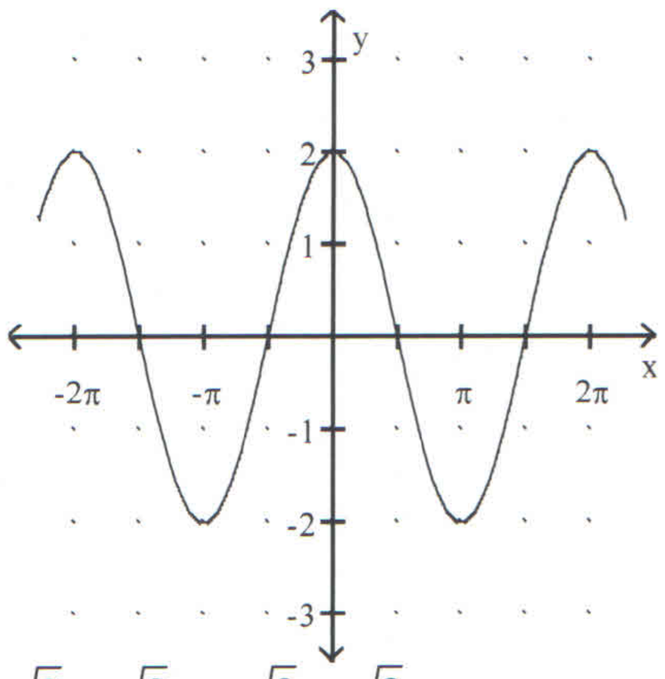
7) $12(\cos 315° + i \sin 315°)$

8) −153

9) 946 mi

10) 47.7°

11)



12) $\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}i, -\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}i$

13) $\frac{\sqrt{2}}{2}$

14) $\ln|\csc x| = \ln|(\sin x)^{-1}| = -\ln|\sin x|$.

15) $0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$

16) 104°

17) 45°

18) $\frac{5\pi}{12}$

19) A = 28°, a = 10.3, b = 19.4

20) Horizontal: $38\sqrt{2}$ mph, vertical: $38\sqrt{2}$ mph

21) 4799 ft