Name _____

Period _____Date_____

I. Write the letter corresponding to the most correct answer in the space.

_____1. In △ABC, m∢A = 55°, b = 8.6 and c = 6.5. Find **a** to the nearest tenth,
   A) 7.0   B) 7.1   C) 7.2   D) 7.3   E) 7.4

_____2. Find the area of the triangle to the right.
   A) 30.1
   B) 70.9
   C) 84.3
   D) 121.8
   E) None of the above

14

78°

35°
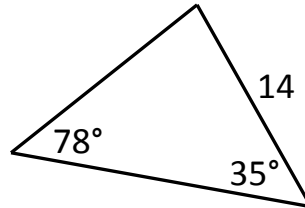
_____3. In △ABC, ∢C is a right angle, m∢A = 35°, and a = 36.3. Find **b** to the nearest tenth.
   A) 0.018   B) 25.4   C) 29.7   D) 44.3   E) 51.8

_____4. Given △XYZ, x = 7, y = 13, and z = 8. The largest angle of this triangle is:
   A) 30°   B) 45°   C) 60°   D) 120°   E) 150°

_____5. In the figure to the right, RK is 6
   and θ terminates in the third quadrant.
   Find the x coordinate of point K.
   A) 6 cos θ   B) -6cos θ
   C) 6 sin θ   D) -6sin θ
   E) none of these

θ

R

K
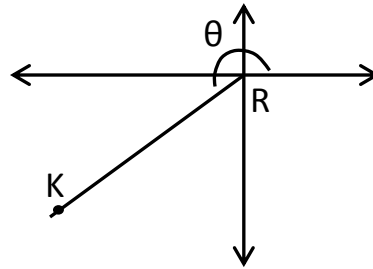
_____6. Which of the following was the basis behind the derivation of the LAW OF SINES?
   A) the law of cosines   B) the distance formula
   C) the Pythagorean Theorem   D) the height of a triangle
   E) the quadratic formula

_____7. Find the x component of $A - B$ if A = 6 and A makes a 78° angle with the positive x
   axis, and B = 9 and B make a 213° angle with the positive x axis.

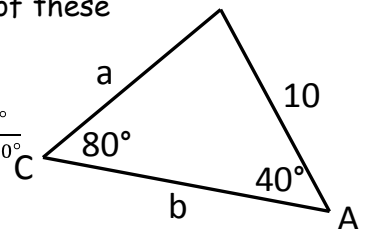   A) $-6.30\imath$ B) $0.967\imath$ C) $6.15\imath$ D) $8.80\imath$ E) $10.77\imath$

_____8. Find the standard position angle made by r if $r = -4\imath - 7\jmath$
   A) 209.74°   B) 214.85°   C) 235.15°   D) 240.26   E None of these

_____9. For the triangle to the right, a =
   A) $\dfrac{10\sin 40°}{\sin 80°}$ B) $\dfrac{10\sin 60°}{\sin 40°}$ C) $\dfrac{10\sin 80°}{\sin 40°}$ D) $\dfrac{10\sin 60°}{\sin 80°}$ E) $\dfrac{\sin 40°}{10\sin 80°}$

a

10

80°

C

b

40°

A

II. Write complete answers to each of the following. SHOW ALL WORK FOR FULL CREDIT

1. You ARE THE TORPEDO officer on the U. S. S. Mathboat, AND YOU SPOT an enemy missile heading for Washington. You place the missile 7300 m away-at at a bearing of 127° (pilot's notation as shown). You calculate that the missile must be traveling at a 347° angle. If your torpedoes have a range of 6400 m and the Mathboat remains stationary, between what two bearings can you fire torpedoes that will destroy the missile and save Washington? (Remember to state bearings in pilot's notation to the nearest hundredth of a degree.)

127°

7300m

347°
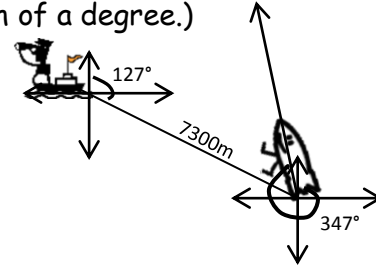
2. a) If ABCDE is a regular pentagon (with all congruent sides and all congruent angles), find the length of diagonal AC if side AB = 10. (to the nearest hundredth)

   b) In the figure above, find the measure of <ACD

3. A farmer sketched the diagram of his field as shown. How much fencing is required to enclose the field? (to the nearest foot)

700 ft

106°

900 ft

74°

1200 ft
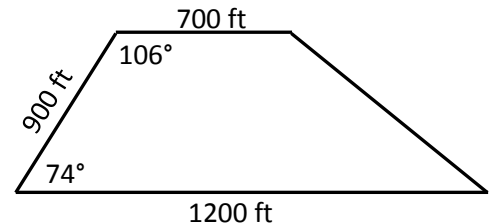
4. A water molecule consists of two hydrogen atoms and one oxygen atom is joined as shown. The distance between the nucleus of each hydrogen atom and the oxygen atom's nucleus is 9.58 X 10^{-9} cm, and the bond angle is 104.8°. How far apart are the hydrogen nuclei?   H——O

H
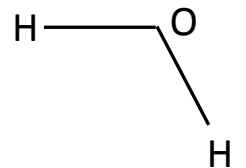
5. The consecutive sides of a quadrilateral inscribed in a circle have lengths of 1, 2, 3, AND 4. Find the length of AB using the fact that opposite angles must be supplementary (to the nearest hundredth)

A

2

1

B

3

4