Math 1060 Exam 3 Name_____
Practice

Show all work for any credit – All problems are worth 5 points unless noted.

Two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that results.

1) $C = 35°$, $a = 18.7$, $c = 16.1$ 1) _____

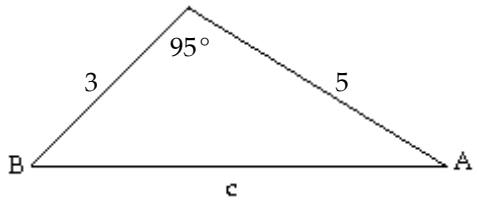
2) $B = 80°$, $b = 6$, $c = 8$ 2) _____

Solve the problem.

3) A ship sailing parallel to shore sights a lighthouse at an angle of $14°$ from its direction of travel. After traveling 4 miles farther, the angle is $21°$. At that time, how far is the ship from the lighthouse? 3) _____

Find the length of side c.

4) 4) _____



The polar coordinates of a point are given. Find the rectangular coordinates of the point.

5) $\left(5, -\frac{4\pi}{3}\right)$ 5) _____

The rectangular coordinates of a point are given. Find polar coordinates for the point.

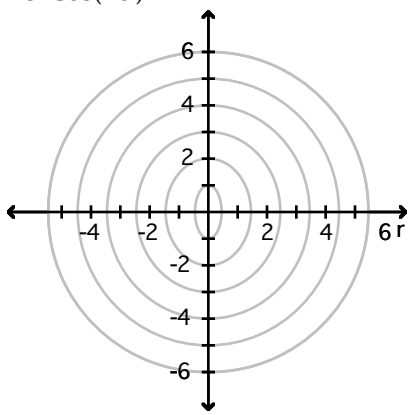
6) $(\sqrt{3}, -1)$ 6) _____

The letters r and θ represent polar coordinates. Write the equation using rectangular coordinates (x, y).

7) $r = \cos\theta$ 7) _____

(10 points) **Graph the polar equation.**

8) $r^2 = -3\ \mathrm{Cos}(2\theta)$ 8) _____



Write the complex number in polar form. Express the argument in degrees, rounded to the nearest tenth, if necessary.

9) $1 - \sqrt{3}i$ 9) _____

Find zw as specified. Leave your answer in polar form.

10) $z = 5(\cos 35° + i \sin 35°)$ 10) _____

$w = 2(\cos 40° + i \sin 40°)$

10 Points) Write the expression in the standard form a + bi.

11) $(1 - i)^{10}$ 11) _____

(10 points) **Find all the complex roots. Leave your answers in polar form with the argument in degrees.**

12) The complex fiourth roots of $-2i$ 12) _____

Find the unit vector having the same direction as v.

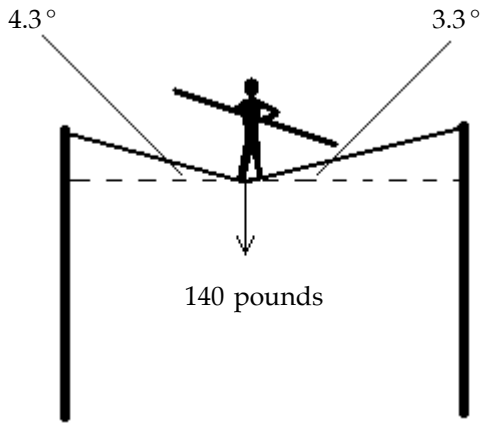
13) $\mathbf{v} = 3\mathbf{i} + 4\mathbf{j}$ 13) _____

Solve the problem.

14) Two forces, $\mathbf{F_1}$ of magnitude 35 newtons (N) and $\mathbf{F_2}$ of magnitude 55 newtons, act on an object at angles of $45°$ and $-60°$ (respectively) with the positive x–axis. Find the direction and magnitude of the resultant force; that is, find $\mathbf{F_1} + \mathbf{F_2}$. Round the direction and magnitude to two decimal places. 14) _____

Set up the two equations to solve this problem. DO NOT SOLVE THE SYSTEM.

15) A tightrope walker located at a certain point deflects the rope as indicated in the figure. If the weight of the tightrope walker is 140 pounds, how much tension is in each part of the rope? Round your answers to the nearest tenth. 15) _____



Find the dot product v • w.

16) $\mathbf{v} = 6\mathbf{i} - 3\mathbf{j}$, $\mathbf{w} = 8\mathbf{i} + \mathbf{j}$ 16) _____

Find the angle between v and w by using the dot product. Round your answer to one decimal place, if necessary.

17) $\mathbf{v} = 2\mathbf{i} - 2\mathbf{j}$, $\mathbf{w} = 3\mathbf{i} + 2\mathbf{j}$ 17) _____

1) two triangles
$A_1 = 42°$, $B_1 = 103°$, $b_1 = 27.4$;
$A_2 = 138°$, $B_2 = 7°$, $b_2 = 3.4$
ID: AT10 9.2.2–9+

2) no triangle
ID: AT10 9.2.2–8+

3) 7.94 mi
ID: AT10 9.2.3–3+

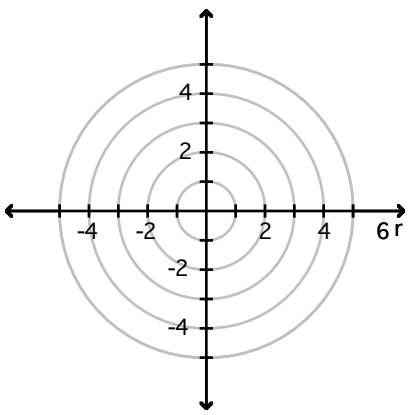
4) $c = 6.05$, $A = 29.6°$, $B = 55.4°$
ID: AT10 9.3.1–2+

5) $\left(-\frac{5}{2}, \frac{5\sqrt{3}}{2}\right)$
ID: AT10 10.1.2–5+

6) $\left(2, -\frac{\pi}{6}\right)$
ID: AT10 10.1.3–4+

7) $x^2 + y^2 = x$
ID: AT10 10.1.4–11+

8)



lemniscate
ID: AT10 10.2.3–5+

9) $2(\cos 300° + i \sin 300°)$
ID: AT10 10.3.2–1+

10) $10(\cos 75° + i \sin 75°)$
ID: AT10 10.3.3–3+

11) $-32i$
ID: AT10 10.3.4–7+

12) $\sqrt[5]{2}(\cos 54° + i \sin 54°)$, $\sqrt[5]{2}(\cos 126° + i \sin 126°)$, $\sqrt[5]{2}(\cos 198° + i \sin 198°)$, $\sqrt[5]{2}(\cos 270° + i \sin 270°)$, $\sqrt[5]{2}(\cos 342° + i \sin 342°)$
ID: AT10 10.3.5–4+

13) $\mathbf{u} = \frac{3}{5}\mathbf{i} + \frac{4}{5}\mathbf{j}$
ID: AT10 10.4.5–3

14) Direction: –23.65 °; magnitude : 57.04 N
ID: AT10 10.4.6–9+

15) tension in the left part: –365.8 lb;
tension in the right part: –360.7 lb
ID: AT10 10.4.7–3

16) 45
ID: AT10 10.5.1–4+

17) 78.7°
ID: AT10 10.5.2–1