MATH 105: Trigonometry

Exam 2

July 18, 2013

To receive full credit you must clearly show all work and justify your answers. Give only exact solutions unless otherwise indicated. No books, or notes are allowed during this exam.

NAME:

Question:	1	2	3	4	5	6	7	Total
Points:	5	10	10	10	10	10	10	60
Score:								

Identity Names

- Reciprical Identities

- Quotient Identities

- Even-Odd Identities

- Pythagorean Identities

- Addition and Subtraction Identities for Cosine

- Addition and Subtraction Identities for Sine

- Addition and Subtraction Identities for Tangent

- Cofunction Identities

- Double Angle Identites

- Half Angle Identites

- Sum to Product Identities

- Product to Sum identities

(5 points)   1. Rewrite $\sin(3v) - \sin(v)$ as a product of two trigonometric functions.

(10 points)   2. Given that $i = \sqrt{-1}$, find the exact value of $\left(-2 + 2\sqrt{3}i\right)^5$. Give your answer in the form $a + bi$ (**not** trigonometric form).

(10 points)   3. Solve $2 + \sin(t) = 2\cos^2(t)$ for $0 \le t < 2\pi$ (t in radians). Give only exact values.

(10 points)   4.   (a) Convert the polar equation $r = -16\sin(\theta)$ to a Cartesian equation.

             (b) Sketch the graph of $r = -16\sin(\theta)$.

(10 points)   5. An airplane with an airspeed of 290 miles per hour with a heading of S20°E. The wind is blowing at 80 miles per hour directly to the west. Find the ground speed, course and drift angle of the airplane. Round answers to two decimal places.

(10 points) 6. Solve the triangle ABC where $c = 15$, $\beta = 42°$, and $b = 10.7$. Round your answers to three decimal places.

(10 points)   7. Let $\vec{u} = 2\vec{i} + 3\vec{j}$ and $\vec{v} = 4\vec{i} + \vec{j}$. Find

    (a) $3\vec{u} - 2\vec{v}$

    (b) a unit vector in the same direction as $\vec{u}$