



Mathematics 17
Fifth Long Examination

M17_LE5_002
College Algebra and Trigonometry
First Semester, AY 2007-2008

I. Write TRUE if the statement is true. Otherwise, write FALSE.

(1 pt each)

1. The Arcsine and Arccosine functions are periodic.
2. For all real values of x , $\tan(\text{Arc tan } x) = x$.
3. There is no triangle having sides of length 3, 4, and 7 cm.
4. The graph of the function $y = \text{Arc cot } x$ has no x -intercept.
5. The principal argument of θ of any complex number is unique.

II. Do as indicated.

1. Determine the number of triangles formed given that $\alpha = 60^\circ$, $a = 9$, $b = 10$. (2 pts)
2. Evaluate: $\cos\left(2\text{Arc tan}\left(-\frac{3}{4}\right) + \text{Arc csc}\sqrt{2}\right)$. (4 pts)
3. Find the exact value of $\cot(\text{csc}^{-1}(\sec 210^\circ) - 210^\circ)$. (4 pts)
4. Simplify: $\frac{i(\sqrt{3}\text{cis}12.5)^\circ}{-\sqrt{6}-\sqrt{6}i}$. (4 pts)

III. Find the solution set of the following.

(4 pts each)

1. $\tan^{-1}\sqrt{x} - \tan^{-1}\sqrt{1-x} = \tan^{-1}\left(\frac{4}{3}\right)$
2. $3\cos\left(x + \frac{\pi}{6}\right) + 2\sin^2\left(x + \frac{\pi}{6}\right) = 3$, $0 \leq x < 2\pi$
3. $4\cos^4x - 3\cos^2x + 2 = 0$, $0 \leq x < 2\pi$
4. $x^4 - \sqrt{6} - \sqrt{2}i = 0$

IV. Word Problems.

(5 pts each)

1. The M17 U5 class in a children's park observed that a 28-foot slide makes an angle of 30° with the ground. Its top is reached by the ladder inclined 45° to the ground. Find the length of the ladder and the distance of the top of the slide from the ground.
2. A lamp post is 100 feet away from the Math building. From a point on the top of the building, the angle of depression of the top of the post is 30° , while the angle of depression of its base is 60° . Find the height of the lamp post.
3. The M17 W5 class on a cruise ship sailed due east from a point A to a point B for $\sqrt{6}$ mi. Then it turned in the direction $N 75^\circ W$ and sailed to a point C which is 2 mi away from point B . If the ship is found to be $\sqrt{3} - 1$ mi away from A , what is the bearing of the ship from A ?

END OF EXAM