The college of Staten Island, Dept. of Mathematics
Prof. M. Talafha
Final Exam , Form A, May 23, 2007

MTH 130
Spring 07

Q1(6 Pts.) Simplify, write your answer in the form of $a+bi$:

a) $\dfrac{3+6i}{5+i}$ b) $(7-3i)(8-5i)$

Q2(6 pts.) Graph:

$$f(x)=\begin{pmatrix} -2x & , & for\ x<-2 \\ -x^2 & , & for\ -2\le x\le 2 \\ 5 & , & for\ x>2 \end{pmatrix}$$

Q3.(6 Pts.) For the polynomial function $p(x)=x^4-2x^3-5x^2+4x+6$:

a) Solve $p(x)=0$.

b) Express $p(x)$ as a product of linear factors.

Q4(6 Pts.) a) Use long division to divide : $(2x^4-3x^2+x-6)\div(x+2)$

b) Use synthetic division to find the quotient and remainder. Show you work.

Q5(6 Pts.) Find the zeros of the polynomial function $f(x)=x(2x-1)^2(x-4)^3$ and State the multiplicity of each.

Q6(8 pts.) **Graph** $f(x)=\dfrac{2x^2-2}{x^2-x-6}$. Label all the asymptotes and the intercepts.

Q7(6 pts.) . Find a formula for the inverse function of : $f(x)=\dfrac{x-2}{x-4}$.

Q8(6 Pts.) Find the exact function value, if it exists.

a) $\cos 315^\circ$ b) $\tan\dfrac{4\pi}{3}$ c) $\sec\dfrac{5\pi}{6}$

Q9(6 Pts.) Given that $\sin\theta = \frac{-3}{5}$ and θ is in quadrant IV, find $\sin 2\theta$, $\cos 2\theta$, and $\tan 2\theta$.

Q10(6 Pts.) Solve Δ ABC, if possible. Round answers to the nearest tenth.
$a = 4.8\,cm$, $b = 6.6\,cm$, $c = 8.3\,cm$.

Q11(6 Pts.) a) Find $\tan^{-1}\left(\frac{-\sqrt{3}}{3}\right)$ Exactly in degrees.

b) Evaluate: $\tan\left(\cos^{-1}\frac{\sqrt{3}}{2}\right)$

Q12(8 Pts.) Find all the solutions of: $3 - 4\sin^2 x = 0$ *in* $[0, 2\pi)$.

Q13(6 Pts.) Find $(4\sqrt{3} - 4i)^5$ and write standard notation $a + bi$ for the answer.

Q14(6 Pts.) Find the trigonometric notation for : $-2 - 2\sqrt{3}\,i$.

Q15(6 Pts.) Find the center, the vertices, and the foci of : $9x^2 - 16y^2 = 144$.
Then Graph.

Q16(6 Pts.) Find the center and the radius of the circle given by
$x^2 + 4x + y^2 - 10y - 7 = 0$. **Then Graph**.

Good luck and have a great summer