Math 1351-013 Exam I-A February 6, 2004

Answer the problems on **separate** paper. You do not need to rewrite the problem statements on your answer sheets. Do your own work. Show **all relevant steps** which lead to your solutions. Attach this question sheet to the front of your answer sheets.

1. (16 pts) Let $P(-4,3)$ and $Q(1,2)$ be points in the plane.

   A. Plot P and Q on a Cartesian coordinate system
   B. Find the distance between P and Q
   C. Find the coordinates of the midpoint M of the line segment $\overline{PQ}$
   D. Find the equation of the line passing through P and Q. Write the equation in standard form.

2. (8 pts) Solve the equation $|4-3y|=5$.

3. (8pts) Solve algebraically the system of equations $\begin{cases} 2x+3y=12 \\ -4x+8y=18 \end{cases}$

4. (12 pts) Let $f(x)=\dfrac{1}{\sqrt{3+2x}}$.

   A. Find the domain of f
   B. Compute the following functional values or state that the corresponding x-value is not in the domain of f

   B1. $f(-2)$ B2. $f(-1)$ B3. $f(1)$

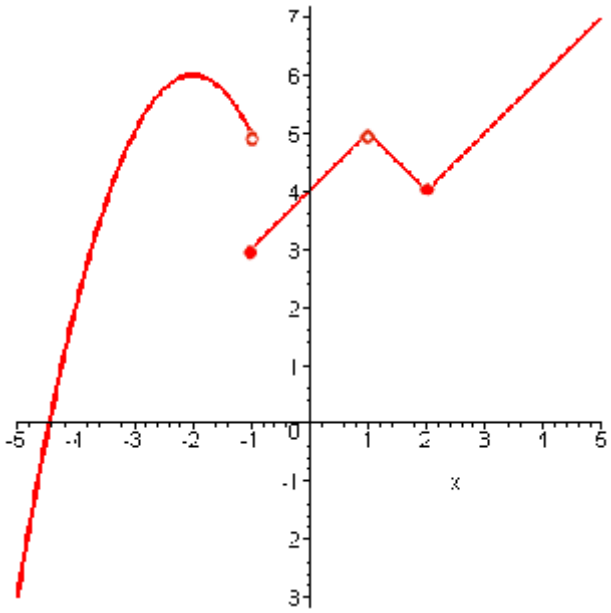
5. (12 pts) Let $f(x)=2-3x$.

   A. Find the inverse of f
   B. Sketch the graphs of f and f^{-1} on same coordinate system.

6. (6pts) Find the exact value of $\cos(\sin^{-1}-\dfrac{1}{2})$.

7. (6pts) Simplify $\tan(\cos^{-1}x)$

8. (12pts) Consider the function f defined by the graph to the right. Find each of the following (if they exist). If they do not exist, state so.



A1. $f(-1)$ A2. $f(1)$ A3. $f(2)$

B1. $\lim_{x\to -1^-} f(x)$ B2. $\lim_{x\to 1^-} f(x)$ B3. $\lim_{x\to 2^-} f(x)$

C1. $\lim_{x\to -1^+} f(x)$ C2. $\lim_{x\to 1^+} f(x)$ C3. $\lim_{x\to 2^+} f(x)$

D1. $\lim_{x\to -1} f(x)$ D2. $\lim_{x\to 1} f(x)$ D3. $\lim_{x\to 2} f(x)$

9. (24 pts) Algebraically evaluate each of the following limits.

A. $\lim_{x\to 2} \dfrac{x^2+3x-7}{x^2-3x+1}$

B. $\lim_{x\to -2} \dfrac{4-x^2}{2+x}$

C. $\lim_{x\to 0} \dfrac{\sin 4x}{9x}$