Name:_____ Date:_____ **TEST 2 Precalculus** Spring 2009 Mkrtchyan

YOU MUST SHOW ALL OF YOUR WORK to receive full credit for the problem. The more work you show on your paper leading to your solution will give me more opportunity to award partial credit. Clearly indicate your solution to the problem.

1) Given that the line *m* passes through the points (1,-2) and (2,3), write an equation of the line *n* that is perpendicular to *m* and intersects *m* at (1,-2).

2) Check if graphs of the following functions are symmetric to x,y-axes, to the origin or to none of them.
   (a) f(x)=cosx+3   (b) g(x)=-5x^5 (c) h(x)=2sinx

3) Find the radius, center and x,y-intercepts (if any) of the following circle.
   $$4x^2 + 4y^2 - 24x - 12y + 29 = 0$$

4) Solve the following equations
   (a) -|3x+1|+2=3

   (b) t^{-2}-7t^{-1}+12=0

(c) $x^{\frac{4}{3}} + 3x^{\frac{2}{3}} - 28 = 0$

(d) $\sqrt{1-2x} + \sqrt{x+5} = 4$

5) Solve the following inequalities.
   (a) $|3x+5| < 4$

   (b) $\left|\dfrac{x-3}{4}\right| \geq 5$

   (c) $\dfrac{x+4}{2x-5} \leq 0$

6) Determine the domain of the following functions.

   (a) $\sqrt{x^2 - 4x + 3}$

   (b) $\dfrac{2}{x^4 + x^2 - 6}$

7) Given f(x)= $x^2 + x - 6$ and g(x)=2x-3, find the following

   (a) $\left(\dfrac{f}{g}\right)(-2)$

   (b) $(f \circ g)(x)$
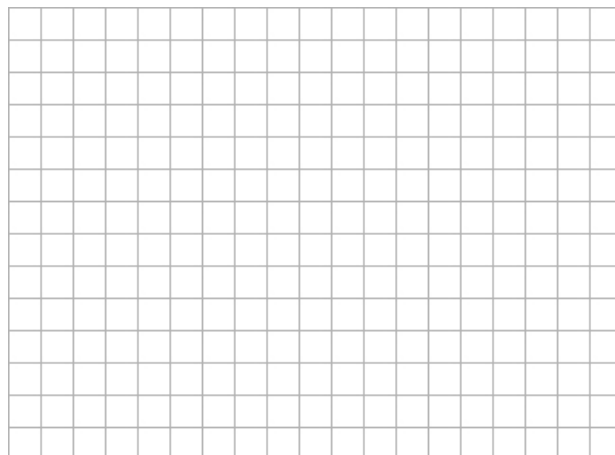
   (c) The rate of change $\dfrac{\Delta g}{\Delta x}$ on the interval [-1,2]

   (d) The difference quotient $\dfrac{f(x+h) - f(x)}{h}$

8) Given a piecewise defined function $f(x) = \begin{cases} |x|, -1 \le x \le 1 \\ \sqrt{x}, 1 \le x \le 5 \end{cases}$
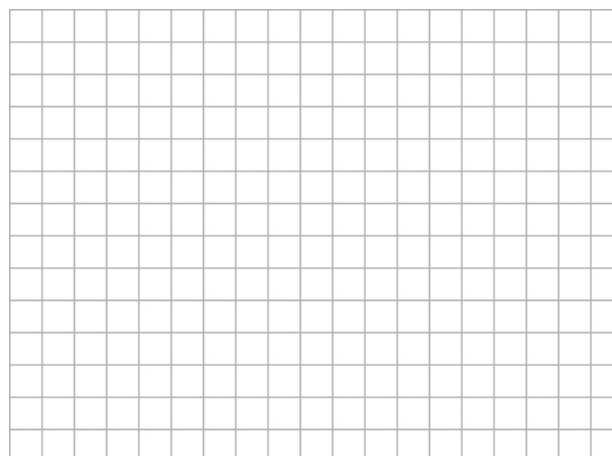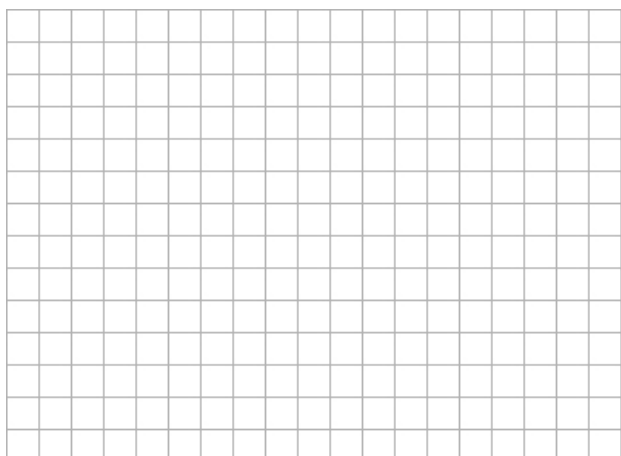
(a) Find f(-1/2) and f(2)

(b) Graph f(x)

9) (a) graph $f(x) = \sin x$ (b) Using part (a) graph $f(x) = -\sin(x - \frac{\pi}{4}) + 1$

10) Given $f(x) = \frac{2}{3}x + 1$ find $f^{-1}(x)$

11) Verify that the functions f and g are inverses where $f(x) = \frac{1}{3}x + 2$ and $g(x) = 3x - 6$.

4