MA1032 Test 3 Fall 2006

Name:_____

Non-calculator section: You may not use your calculator on this section. You must show enough work to justify all answers. Once you have handed in this section you may not have it back.

Page	Score	
0		
1		/ 15
2		/ 5
Non-calculator total		/ 20
Calculator total		/ 20
Final score		/ 40

1. Showing the algebra, determine whether $h(x) = -x^3 + 3x^2 - 2$ is even, odd, or neither.

$$h(-x) = x^{3} + 3x^{2} - 2$$
$$-h(x) = x^{3} - 3x^{2} + 2$$

h(x) is not even because $h(-x) \neq h(x)$. h(x) is not odd because $h(-x) \neq -h(x)$.

Neither [5]

- 2. Starting with the function f(x) = |x|, transformations are performed to arrive at the new function $g(x) = \frac{-1}{2}f(3(x+1)) 2$.
 - (a) List the transformations, being sure to put them in the proper order.
 - Horizontal shrink by $\frac{1}{3}$ [1]
 - Horizontal shift left 3 units [1]
 - Vertical flip (over x-axis) [1]
 - Vertical shrink by $\frac{1}{2}$ [1]
 - Vertical shift down 2 units [1]

When grading, I also accepted interchanging the order of the horizontal shrink and shift. Note that this would not work with the book's definition of a shrinking, which is about the *y*-axis. However, if your interpretation is to shrink about the "center" of the curve, then it will work, which is why I will accept this as a possible answer. However, if you use this order you will must shrink accordingly when you make the graph below.

(b) Now draw the graph of g(x) on the following axes. If you draw intermediate graphs, be sure to clearly label the your final graph, i.e. g(x). Remember to label your scale. [5]



3. Match the functions with their graph in the figure below.



 $y = \log x \quad \mathbf{D} \quad [1]$

- $y = 2^x \quad \mathbf{B} \quad [1]$
- $y = e^{-x}$ E [1]
- $y = \ln x$ C [1]
- $y = 3^x \quad \mathbf{A} \quad [1]$

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Name:_____

Calculator section: You may use your calculator on this section after turning in the non-calculator section. You must show enough work to justify all answers.

Page	Score	
1		/ 11
2		/ 9
Calculator total		/ 20

1. Find the principle, symmetric and then all solutions to $\sin(2x - \pi) = \frac{-1}{4}$. You may find the graph below useful.



Principle: 1.4445 [3]

Symmetric: 1.6971 [2]

All solutions: $1.4445 \pm \pi k$ and $1.6971 \pm \pi k$ where k = 0, 1, 2, ... [2]

2. A central angle of 3° lies in a circle of radius 6 feet. To six decimal places, find the lengths of the arc and the chord determined by this angle.

Arc: 0.314159 [2]

Chord: 0.314123 [2]



Use the following graph of y = f(x) for questions 3 and 4.

3. Using the graph above, find the following.

- Amplitude: 225 [1]
- Midline: y = 250 [1]
 - Period: 30 [1]
- Horizontal Shift: 0 [1]

4. Find the equation for the graph y = f(x) given above.

$$y = f(x) = -225\cos(\frac{2\pi}{30}x) + 250$$
 [5]