

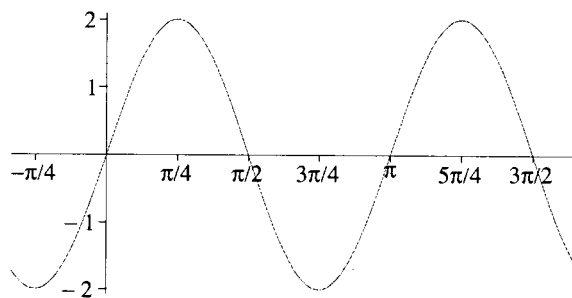
Math 113 Second Exam
Version B

June 4, 2004
11:30am - 12:20pm
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NAME:

Keep exact values whenever possible.
Full credit can only be given to justified answers.

1. (30 points) Below is the graph of the function $y = A \cos(Bx + C)$. Find the values of A , B and C .



2. (35 points) For an angle Θ , we know that $\sin \Theta = \frac{1}{4}$ and that $\frac{1}{2}\pi \leq \Theta \leq \pi$. Find the **exact** values of $\cos \Theta$, $\tan \Theta$, $\cot \Theta$.

3. (20 points) Determine the **exact** value of

$$\sin \left(\sin^{-1} \frac{1}{4} \right), \cos \left(\sin^{-1} \frac{1}{4} \right), \tan \left(\sin^{-1} \frac{1}{4} \right), \cot \left(\sin^{-1} \frac{1}{4} \right).$$

4. It can be shown that

$$\cos(22.5^\circ) = \frac{\sqrt{2 + \sqrt{2}}}{2}.$$

- (a) (10 points) Use this to find the **exact** value of $\sin(22.5^\circ)$.
- (b) (10 points) Verify that the sum identities for $\sin(45^\circ) = \sin(22.5^\circ + 22.5^\circ)$ and $\cos(45^\circ) = \cos(22.5^\circ + 22.5^\circ)$ give **exactly** the correct answer.
- (c) (15 points) Use the exact values of sine and cosine at 22.5° and 30° to compute the **exact** values of $\sin(52.5^\circ)$, $\cos(52.5^\circ)$, $\tan(52.5^\circ)$, $\cot(52.5^\circ)$. Verify your answer with your calculator.