

MATH 171 - Third Exam November 21, 2000

Your Name: _____

Your TA's Name: _____

*Show all work! Be sure to cross out anything that you do not want graded.
Incorrect work left on your paper will cause you to lose points
even if there is also correct work displayed.*

Problem	Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

Sum and Difference Formulas:

$$\cos(a + b) = \cos(a) \cos(b) - \sin(a) \sin(b)$$

$$\sin(a + b) = \sin(a) \cos(b) + \sin(b) \cos(a)$$

$$\cos(a - b) = \cos(a) \cos(b) + \sin(a) \sin(b)$$

$$\sin(a - b) = \sin(a) \cos(b) - \sin(b) \cos(a)$$

1. (10 pts.) Find the exact value of

$$\cos\left(\frac{\pi}{2} - \frac{5\pi}{3}\right)$$

2. (12 pts.) Find the exact value of the slope of the tangent line to $y = 2\sqrt{\cos(x)}$ at $x = \frac{\pi}{3}$.

3. (12 pts.) (a) For $f(t) = 12 - 8 \sin(10t - \pi)$ determine the following:

(i) amplitude

(ii) period

(iii) vertical shift

(iv) phase shift

(v) $f'(t)$

(b) For $f(t) = 2 + 6 \tan(4t + \pi)$ determine the following:

(i) period

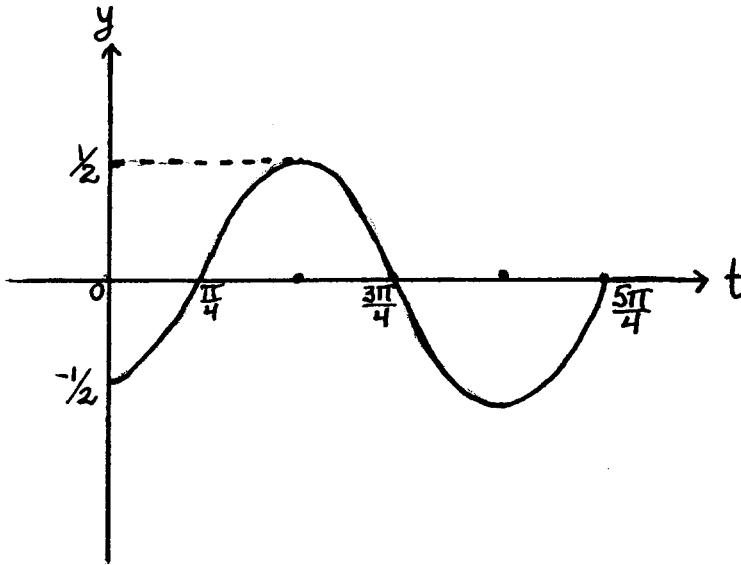
(ii) vertical shift

(iii) phase shift

(iv) the exact value of $f(t)$ at $t = \frac{\pi}{6}$.

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4. 10 pts (a) The graph below is the graph of some sine function $y = a \sin(k(t-b))$. Determine the sine function and show work.



(b) It is also the graph of some cosine function $y = a \cos(k(t-b))$. Determine the cosine function and show your work.

5. (10 pts.)

(a) For $t = \frac{21\pi}{6}$ find the terminal point on the unit circle determined by t .

(b) An arc length of 12π on a circle of radius 45 corresponds to what central angle in radians? and in degrees?

6. (12 pts.) (a) Determine if the following functions are even or odd or neither. Show your work.

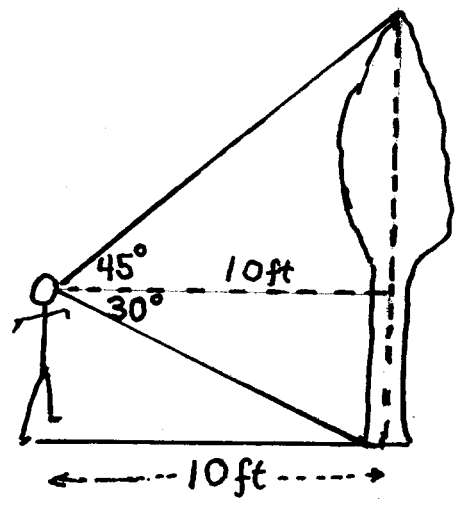
(i) $f(x) = \cos(2x) \sin(2x)$

(ii) $f(x) = \sin(3x) + \cos(3x)$.

(b) Find the following limit. (Hint: the sum formula.)

$$\lim_{h \rightarrow 0} \frac{\cos(h + \frac{\pi}{2})}{h}.$$

7. (12 pts.)



(a) In the picture above compute the exact height of the observer.

(b) Compute the exact height of the tree.

8. (10 pts.) Given $\sec(t) = \frac{-7}{2}$ and $\cot(t) < 0$ find the exact values of all the other trig functions.

9. (12 pts.) In the picture below find the exact value of the distance c .

