

Name _____

M\$6 5 April 2006

SHOW ALL WORK. TO BE TURNED IN AT END OF PERIOD.

1. On a monitor, the graphs of two impulses are recorded on the same screen, where $0^\circ \leq x < 360^\circ$. The impulses are given by the following equations:

$$y = 2 \sin^2 x$$

$$y = 1 - \sin x$$

Find all values of x , in degrees, for which the two impulses meet in the interval $0^\circ \leq x < 360^\circ$. [Only an algebraic solution will be accepted.]

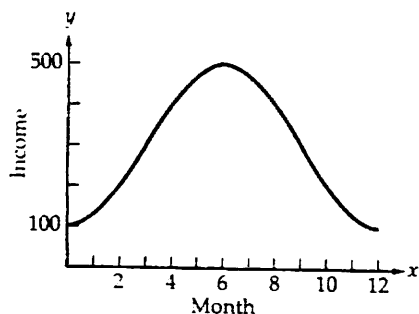
2. If $\sin x = \frac{7}{25}$ and $\cos y = \frac{3}{5}$, and x and y are positive acute angles, find
- $\sin(x + y)$
 - $\cos(x - y)$

3. If $\tan x = 1$, $\sin y = \frac{\sqrt{2}}{2}$, and x and y are positive acute angles, find $\cos(x + y)$.
- | | |
|--------|------------------------------|
| (1) 1 | (3) 0 |
| (2) -1 | (4) $1 + \frac{\sqrt{2}}{2}$ |

4. If A and B are both positive acute angles and $\sin A = \frac{3}{5}$ and $\sin B = \frac{5}{13}$, then $\sin(A - B) =$
- (1) $\frac{16}{65}$ (3) $\frac{33}{65}$
 (2) $-\frac{16}{65}$ (4) $-\frac{33}{65}$

5. If $\sin A = \frac{\sqrt{3}}{2}$, $\sin B = -\frac{1}{2}$, $\frac{\pi}{2} < A < \pi$, and $\pi < B < \frac{3\pi}{2}$, find $\sin(A + B)$.

6. The Bugs Be Gone Exterminating Company specializes in ridding homes of all types of insects. As shown in the diagram below, the company's monthly income over a twelve-month period can be modeled by the equation $y = A \cos Bx + D$. Determine the values of A , B , and D and explain how you arrived at your values.



7. Carlos would like to determine the exact value of $\cos 15^\circ$. Since he knows the exact value of $\cos 45^\circ$ and $\cos 30^\circ$, he can use the formula for the cosine of the difference of two angles. What is the exact value of $\cos 15^\circ$?