**AP Calculus AB**
**Wednesday, October 16, 2013**

10) Determine the concavity of the graph of

$$f(x) = 3\sin(x) + 4(\cos(x))^2$$

at $x = \pi$.

a) 8

b) $-10$

c) 4

d) $-8$

e) $-6$

Flashcard: concavity | second deriv. | tangent | 1st deriv

$f(x) = 3\sin x + 4\cos^2 x$

$f'(x) = 3\cos x + 8\cos x \cdot (-\sin x)$

$f''(x) = -3\sin x + 8\cos x(-\cos x) + (-\sin x)(-8\sin x)$

$f''(x) = -3\sin x - 8\cos^2 x + 8\sin^2 x$

$f''(\pi) = -3\sin\pi - 8(\cos\pi)^2 + 8(\sin\pi)^2$

$f''(\pi) = 0 - 8(-1)^2 + 8(0)^2$

$f''(\pi) = -8$ D