You're told $3\sin(x) + 3\cos(y) - 2\sin(x)\cos(y) + x = 4\pi$

You have to find the slope at $\left(4\pi, \dfrac{3\pi}{2}\right)$

1) Use implicit differentation. Be sure to differnetiate terms with y using the chain rule.

$$\frac{d}{dx}(3\sin(x) + 3\cos(y) - 2\sin(x)\cos(y) + x) = \frac{d}{dx}(4\pi)$$ Setup the derivative

2) Now differentiate each term on both sides with respect to x. Use the chain rule on cos(y) and the product and chain rules on -2sin(x)cos(y)

3cos(x)-3sin(y)y'-2(cos(x)cos(y)+sin(x)(-sin(y)y'))+1=0

3) Distribute the -2 into the parenthesis to prepare for solving for y'.

3cos(x)-3sin(y)y'-2cos(x)cos(y)+2sin(x)sin(y)y'+1=0

4) Now move terms without y' to the right side.

-3sin(y)y'+2sin(x)sin(y)y'=-1+2cos(x)cos(y)-3cos(x)

5) Now factor y' from each term on the left.

y'(-3sin(y)+2sin(x)sin(y))=-1+2cos(x)cos(y)-3cos(x)

6) Now divide both sides by the expression on y'

$$y' = \frac{-1 + 2\cos(x)\cos(y) - 3\cos(x)}{-3\sin(y) + 2\sin(x)\sin(y)}$$

7) Now evaluate this ungodly mess at the point stated in the question:

$$y'\left(4\pi, \frac{3\pi}{2}\right) = \frac{-1 + 2\cos(4\pi)\cdot\cos\left(\frac{3\pi}{2}\right) - 3\cos(4\pi)}{-3\sin\left(\frac{3\pi}{2}\right) + 2\sin(4\pi)\cdot\sin\left(\frac{3\pi}{2}\right)} = \frac{-1 + 2(1)\cdot(0) - 3\cdot(1)}{-3(-1) + 2\cdot 0\cdot -1} = \frac{-1 - 0 - 3}{3} = \frac{-4}{3}$$

8) Therefore the slope is $\dfrac{-4}{3}$.