MATH 120A

Quiz 19

Name: ANSWER KEY Score: _____

Use the method of substitution to solve the system:

$$\begin{cases} x^2+y^2=16 \\ y+2x=-1 \Rightarrow y=-1-2x \end{cases}$$

$\Rightarrow x^2+(-1-2x)^2=16 \Rightarrow x^2+1+4x+4x^2=16$

$\Rightarrow 5x^2+4x-15=0 \Rightarrow x=\dfrac{-4\pm\sqrt{4^2-4\cdot5(-15)}}{2\cdot5}=\dfrac{-4\pm\sqrt{16+300}}{10}=\dfrac{-4+\sqrt{316}}{10}$

$x=\dfrac{-4\pm2\sqrt{79}}{10}=\dfrac{-2\pm\sqrt{79}}{5}$ $\Rightarrow y=-1-2\left(\dfrac{-2\pm\sqrt{79}}{5}\right)=-\dfrac{5}{5}+\dfrac{4\mp2\sqrt{79}}{5}=\dfrac{-1\mp2\sqrt{79}}{5}$

$\boxed{\left(\dfrac{-2\pm\sqrt{79}}{5}, \dfrac{-1\mp2\sqrt{79}}{5}\right)}$

check: $\left(\dfrac{-2+\sqrt{79}}{5}\right)^2+\left(\dfrac{-1-2\sqrt{79}}{5}\right)^2=\dfrac{4-4\sqrt{}+79+1+4\sqrt{}+316}{25}=16$

Similarly for the other root.