Chapter 4 and 5 Test
March 07, 2018
Continue 8.5.6 Systems of Nonlinear Equations (p.123)

#22 The difference of two numbers is 2

\[ x - y = 2 \]

The sum of their squares is 10

\[ x^2 + y^2 = 10 \]

Find the numbers.

\[ \begin{align*}
  y &= 2 \\
  y^2 + y^2 &= 10 & \text{(2)}
\end{align*} \]

Find the equation.

Use here

\[ \begin{align*}
  x &= 2 + y \\
  x &= 2 + 2 \\
  x &= 4
\end{align*} \]

\( x = 2 + (-3) \)

\( x = 2 + 1 \)

\( x = 3 \)

\( (-1, -3) \)

\( (2, 1) \)

Check:

\( \begin{align*}
  x - y &= 2 \\
  x^2 + y^2 &= 10 \\
  (2)^2 + (1)^2 &= 10
\end{align*} \)

\( (3, 1) \)

\( 2^2 + 2^2 = 10 \)

Solution: (?) → (?)}
Chapter 4 and 5 Test
Continue §5.6 Systems of Nonlinear Equations (p.123)

38. The difference of two numbers is 2
\[ x - y = 2 \]

The sum of their squares is 10
\[ x^2 + y^2 = 10 \]

Find the numbers
\[
\begin{aligned}
0 & \quad y = 2 \\
x^2 + y^2 &= 10 & (1)
\end{aligned}
\]

\[
\begin{aligned}
x - y &= 2 \\
0 &= 2 + y \\
x &= 2 + y & (2)
\end{aligned}
\]

\[
\begin{aligned}
x &= 2 + y \\
x &= 2 + \sqrt{10} & (3)
\end{aligned}
\]

\[
\begin{aligned}
x &= 2 + (-3) & x &= 2 + 1 \\
x &= -1 & x &= 3 \\
(1, -3) & (3, 1)
\end{aligned}
\]

Check:
\[
\begin{aligned}
x - y &= 2 & x^2 + y^2 &= 10 \\
(-1, -3) - (-1, -3) &= 2 & (-1)^2 + (-3)^2 &= 10 \\
2 &= 2 & 10 &= 10 \checkmark
\end{aligned}
\]

\[
\begin{aligned}
x - y &= 2 & x^2 + y^2 &= 10 \\
(3, 1) - (3, 1) &= 2 & 3^2 + 1^2 &= 10 \\
2 &= 2 & 10 &= 10 \checkmark
\end{aligned}
\]

No solution: 
\[
\begin{aligned}
12 &= 0 & y &= 3 & y &= 1 \\
\end{aligned}
\]

Solution: 
\[
\begin{aligned}
(?, -3) & (?, 1)
\end{aligned}
\]

March 07, 2018