

Warm Up:

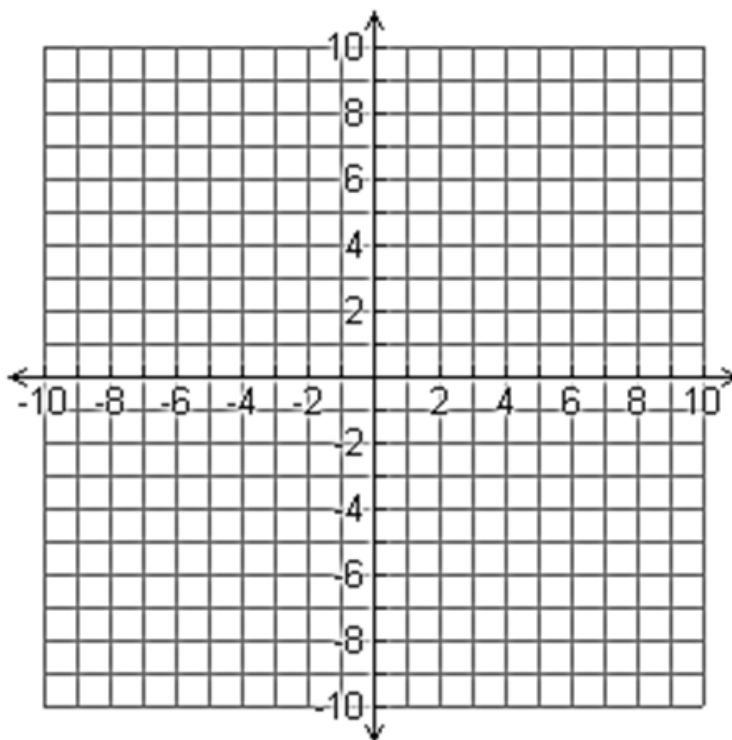
Solve the following systems by graphing.

a) $y=x^2+5x+6$

$y=5$

b) $y=-.5x^2+4$

$y=x$



Solving Non-linear Systems Graphing DLT

1) Determine if the ordered pair is a solution of the system.

a) $2x - y = -4$

$$3x - 5y = 15$$

$$(-5, 6)$$

b) $y = x^2 - 4x + 3$

$$y = x + 2$$

$$(0.5, 1)$$

2) Graph the systems by hand and determine the solution(s).

a) $y = x^2 + 4x + 4$

$$y = 2x + 4$$

b) $x = 3$

$$y = -|x - 4| + 3$$

Solving Non-Linear Systems-Algebraically

Objective:

- Solve non-linear systems using Linear Combination.
- Solve non-linear systems using Substitution.

Solving Non-Linear Systems-Algebraically

Solve the system using Substitution.

a) $y = x^2 + 5x + 6$

$$y = x^2 + 2x + 5$$

Solving Non-Linear Systems-Algebraically

Solve the system using Substitution.

~~$y = x^2$~~
 b) $y = x^2$ ←
 $y = 8 - x^2$

$$\begin{aligned}
 x^2 &= 8 - x^2 \\
 +x^2 & \quad +x^2 \\
 \hline
 2x^2 &= 8 \\
 \frac{2x^2}{2} &= \frac{8}{2} \\
 x^2 &= 4
 \end{aligned}$$

$$\begin{aligned}
 x &= 2 \\
 y &= 2^2 \\
 y &= 4 \\
 (2, 4)
 \end{aligned}$$

$$\begin{aligned}
 x &= -2 \\
 y &= (-2)^2 \\
 y &= 4 \\
 (-2, 4)
 \end{aligned}$$

Solving Non-Linear Systems-Algebraically

Solve the system using Substitution.

TOYO

c) $y = x^2 + 3x + 2$

$$y = 2x + 3$$

Solving Non-Linear Systems-Algebraically

Solve the following algebraically.

d) $y = -x - 3$

$x^2 + y^2 = 17$

$x = -4 \quad x = 1$

$y = -(-4) - 3$
 $y = 1$

$y = -(1) - 3$
 $y = -4$

$(-4, 1)$

$(1, -4)$

$x^2 + (-x-3)^2 = 17$

$x^2 + (-x-3)(-x-3) = 17$

$x^2 + x^2 + 3x + 3x + 9 = 17$

$2x^2 + 6x + 9 = 17$
 $-17 \quad -17$

$2x^2 + 6x - 8 = 0$

$2(x^2 + 3x - 4) = 0$

$(x+4)(x-1) = 0$

$x = -4 \quad x = 1$

Solving Non-Linear Systems-Algebraically

Solve the following algebraically.

$$\begin{array}{r}
 \text{e) } (3x^2 - 2y^2 = 19) \\
 4x^2 - 4y^2 = 20 \\
 \underline{-6x^2 + 4y^2 = -38} \quad \leftarrow \\
 \hline
 -2x^2 = -18 \\
 \frac{-2x^2}{-2} = \frac{-18}{-2} \\
 x^2 = 9
 \end{array}$$

$$\begin{array}{l}
 x = 3 \\
 3(3)^2 - 2y^2 = 19 \\
 3(9) - 2y^2 = 19 \\
 27 - 2y^2 = 19 \\
 -2y^2 = -8 \\
 \frac{-2y^2}{-2} = \frac{-8}{-2} \\
 y^2 = 4 \\
 y = \pm 2
 \end{array}$$

$$\begin{array}{l}
 x = -3 \\
 3(-3)^2 - 2y^2 = 19 \\
 27 - 2y^2 = 19 \\
 -27 - 2y^2 = -27 \\
 -2y^2 = -8 \\
 \frac{-2y^2}{-2} = \frac{-8}{-2} \\
 y^2 = 4 \\
 y = \pm 2
 \end{array}$$

Solving Non-Linear Systems-Algebraically

Solve the following algebraically.

~~TOYO~~

$v(y) = 1$
 f) $xy = 1$

$x + y = 2$
 $-x \quad -x$
 $y = -x + 2$
 (1, 1)

$$x(-x + 2) = 1$$

$$-x^2 + 2x = 1$$

$$-x^2 + 2x - 1 = 0$$

$$x^2 - 2x + 1 = 0$$

$$(x - 1)(x - 1) = 0$$

$$x = 1$$

Review

13. Solve the following non-linear system.

$$\begin{cases} y = |x - 3| + 1 \\ x + 2y = 8 \end{cases}$$

A) (0, 4) B) (4, 2) C) (4, 2) and (0, 4) D) they don't intersect E) None of these

14. An equation is shown, where a , b , and c are integers.

$$y = a(x - b)^2 + c$$

Brian claims that this equation will always have two roots.

Scott claims that this equation will always have zero roots.

Which of the following equations shows that both Brian and Scott are incorrect?

A) $y = \frac{1}{2}(x + 5)^2$

C) $y = 3(x - 6)^2 + 3$

D) $y = -(x - 3)^2 - 4$

B) $y = \frac{-1}{3}(x + 3)^2 + 8$

E) None of these

Review

7. Which of the following is NOT a solution of $(x + 2)(x - 4)(x + 1)(x - 3) = 0$?

- A) -1 B) 3 C) -3 D) 4 E) None of these

8. Factor the polynomial completely: $x^3 - 5x^2 - 4x + 20$

- A) $(x^2 - 4)(x - 5)$ B) $(x + 2)(x - 2)(x - 5)$ C) $(x + 2)(x + 2)(x - 5)$

D) not factorable E) None of these

9. Solve the equation: $5x^6 - 20x^2 = 0$

A) $x = 0, \sqrt{2}, -\sqrt{2}, i\sqrt{2}, -i\sqrt{2}$

B) $x = 0, 2, -2, 2i, -2i$

C) $x = 4, -4$

D) $x = 0$

E) None of these

*Go over Matrix DLT

*Time to work on homework

*Practice ws on graphing inequalities.

W

D

