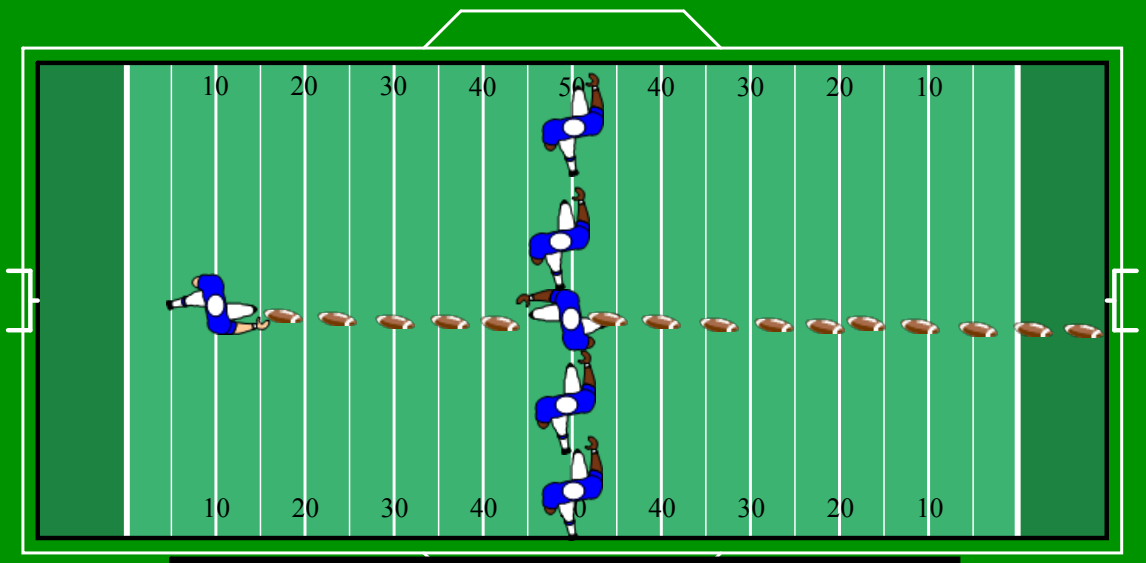
System of Equations

The quarterback throws a straight line pass ("a bullet") to a wide receiver down the field.

Aug 31-2:45 PM

9-2-09 = Chapter 2 System of Equations

The quarterback throws a straight line pass ("a bullet") to a wide receiver down the field.

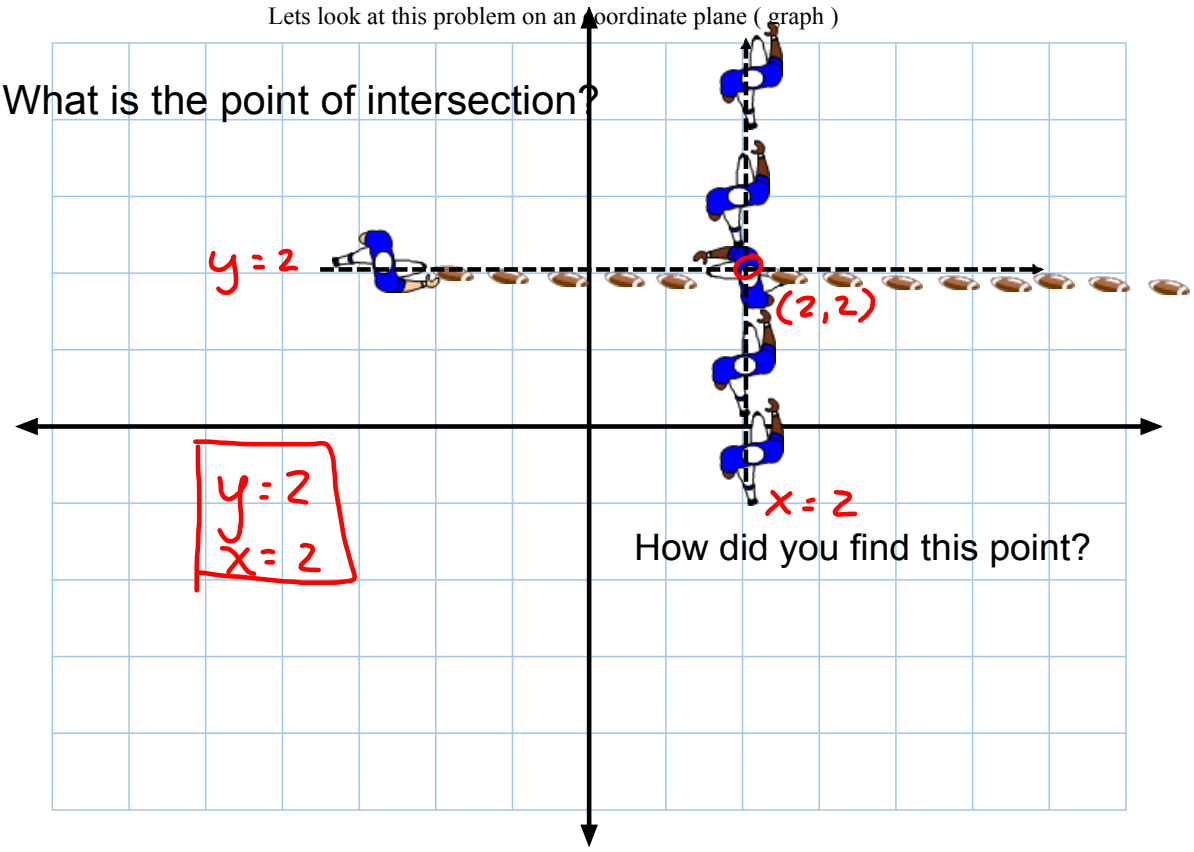


Where will the path of the football and the path of the receiver intersect?

Football - American

Lets look at this problem on an coordinate plane (graph)

What is the point of intersection?



$\boxed{\begin{array}{l} y = 2 \\ x = 2 \end{array}}$

How did you find this point?

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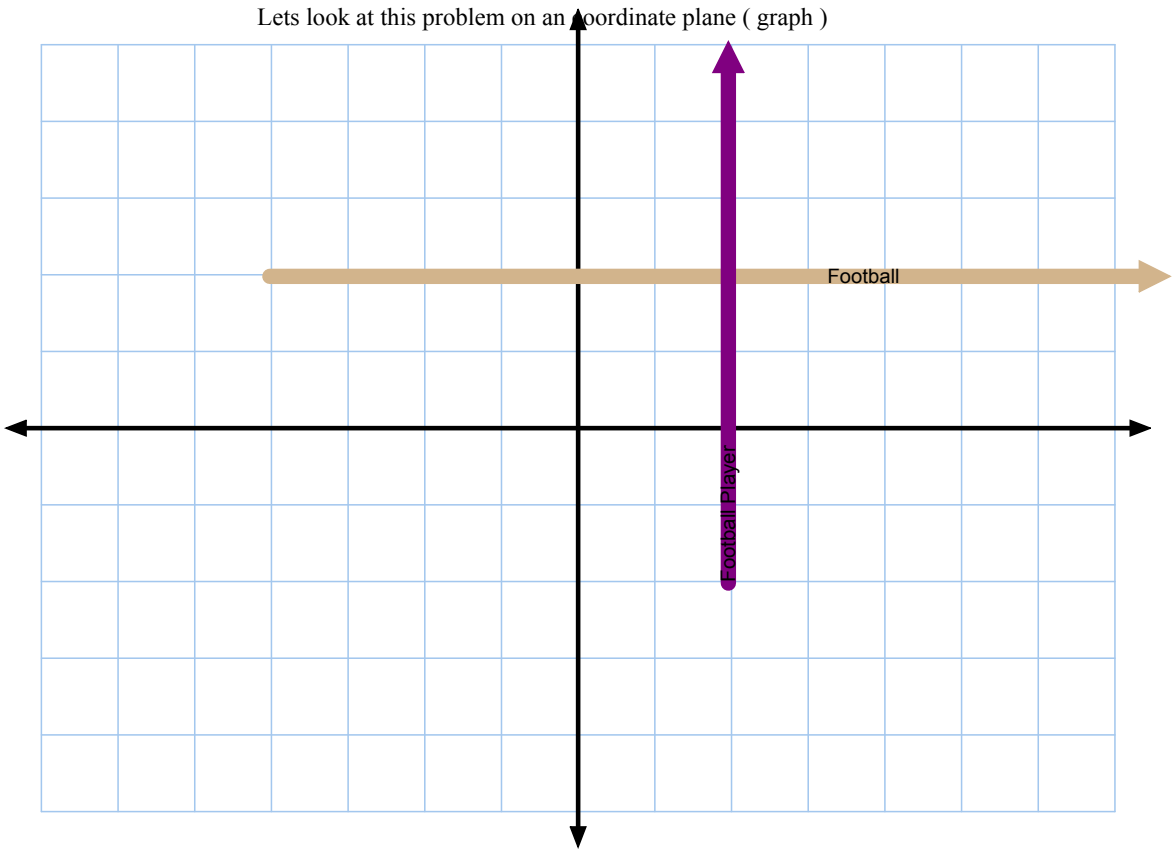
Lets look at this problem on an coordinate plane (graph)



Aug 31-2:48 PM

Find the point of intersection of the following equations.

$y = 2$ and $x = 2$

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Where is the intersection point of the following two lines?

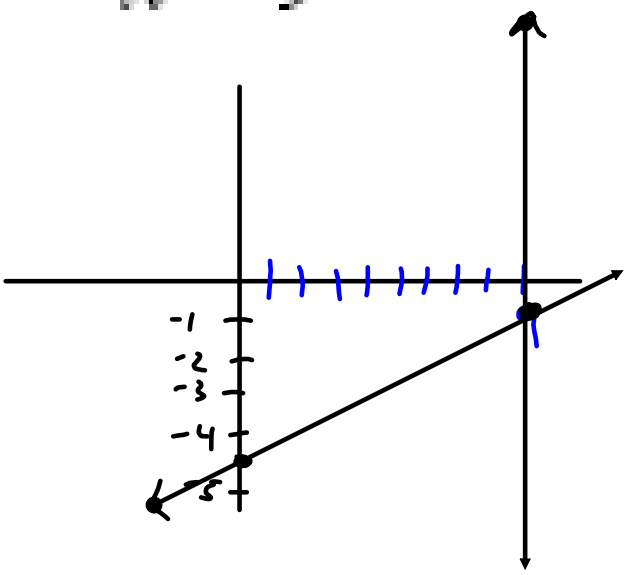
$y = \frac{2}{5}x - \frac{23}{5}$ and $x = 9$

$y = \frac{2}{5}(9) - \frac{23}{5}$

$y = \frac{18}{5} - \frac{23}{5}$

$y = \frac{-5}{5}$

$y = -1$



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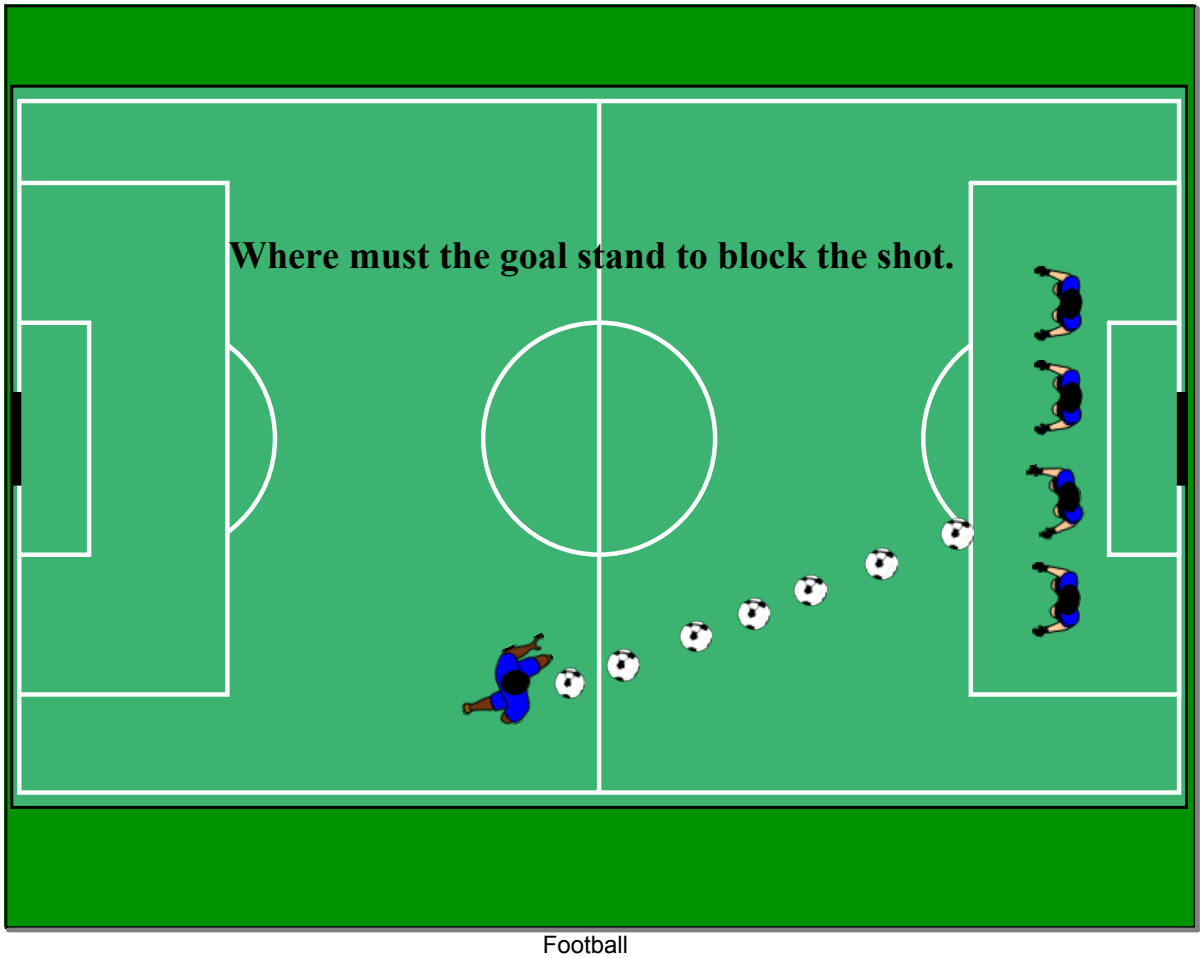
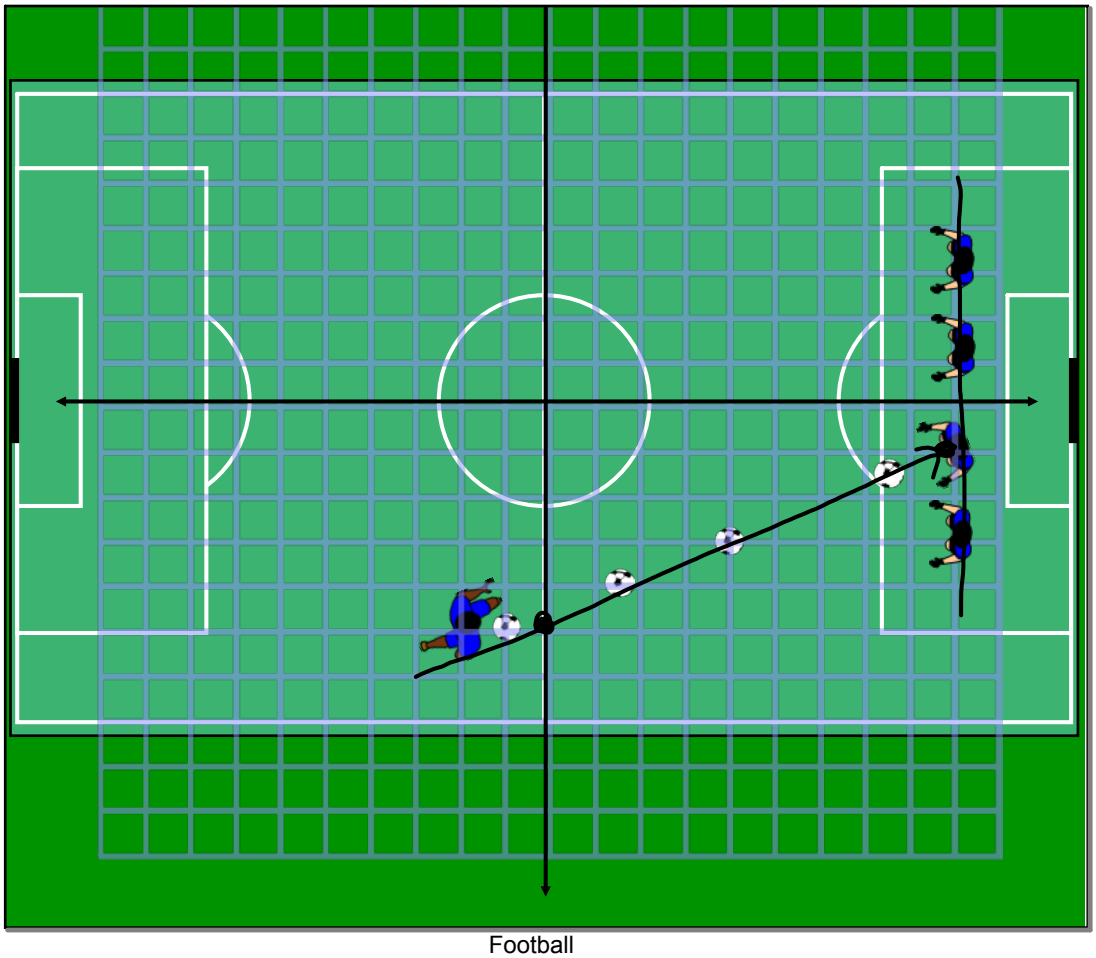
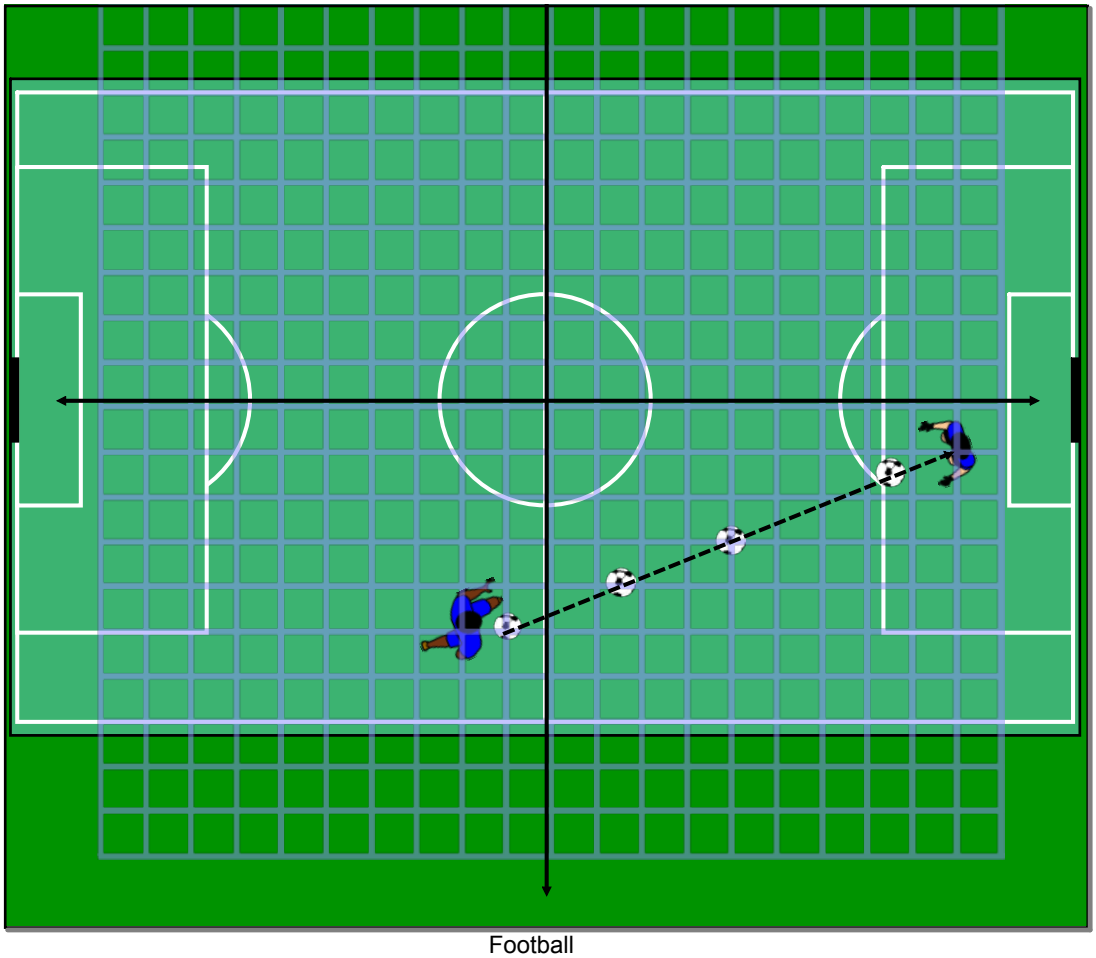


Football



Football



Football

Find the intersection of the following two lines:

$y = -2x + 9$

$y = \frac{1}{3}x + \frac{1}{3}$

$-2x + 9 = \frac{1}{3}x + \frac{1}{3}$

$3(-2x+9) = 3(\frac{1}{3}x + \frac{1}{3})$

$-6x + 27 = 3(\frac{1}{3}x) + 3(\frac{1}{3})$

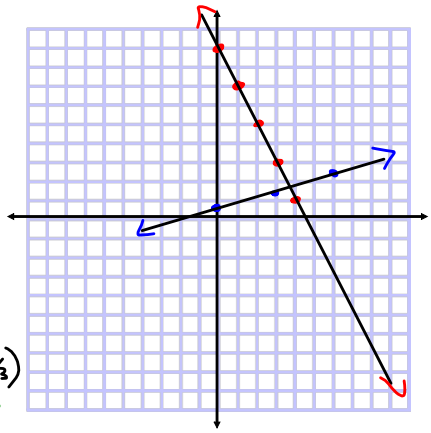
$3/3\,x \quad 3/3$

$-6x + 27 = x + 1$

$-7x + 27 = 1$

$-7x = -26$

$x = \frac{-26}{-7} = \frac{26}{7}$



$y = -2(\frac{26}{7}) + 9$

$= \frac{-52}{7} + \frac{9 \cdot 7}{1 \cdot 7}$

$= \frac{-52}{7} + \frac{63}{7}$

$= \frac{9}{7}$

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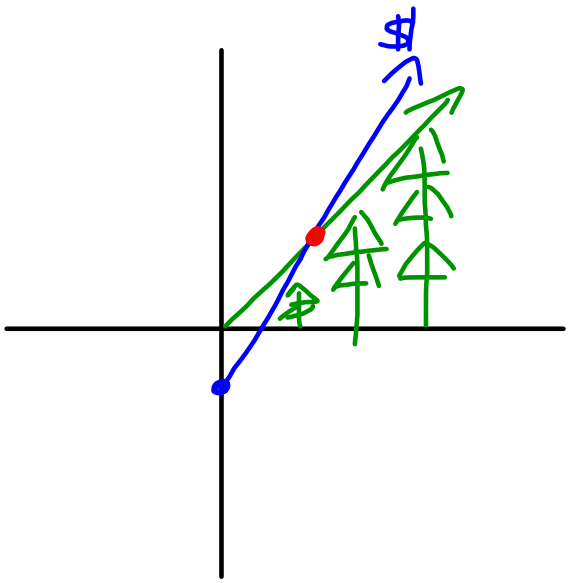
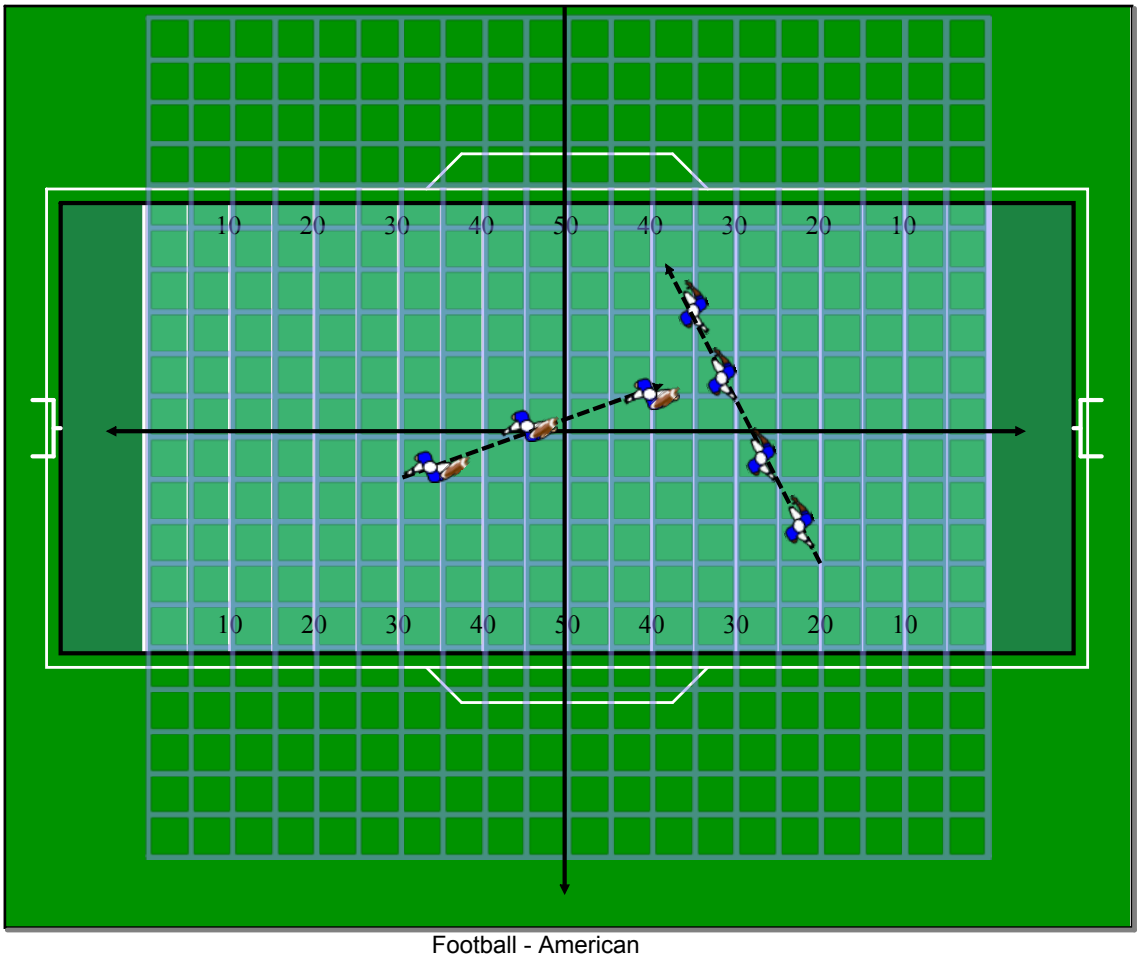


Sep 15-8:39 AM



Football - American

There are other ways to find the intersection point of two lines.

Substitution (solve one equation for a variable, then substitute into the other equation)

Elimination (stack the two equations and add to eliminate a variable)

Use the elimination method to solve the system of equations.

$2x - 3v = -21$
$5x + 6v = 15$

Use the substitution method to solve the system of equations.

$x = 7y + 3$
$2x - y = -7$

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$x + y = 4$
$3x - 2y = 7$

$2x + 3y = 19$
$7x - y = 9$

$4x + 5y = 11$
$3x - 2y = -9$

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Real Estate AMC Homes, Inc. is planning to build three- and four-bedroom homes in a housing development called Chestnut Hills. Consumer demand indicates a need for three times as many four-bedroom homes as for three-bedroom homes. The net profit from each three-bedroom home is $16,000 and from each four-bedroom home, $17,000. If AMC Homes must net a total profit of $13.4 million from this development, how many homes of each type should they build?

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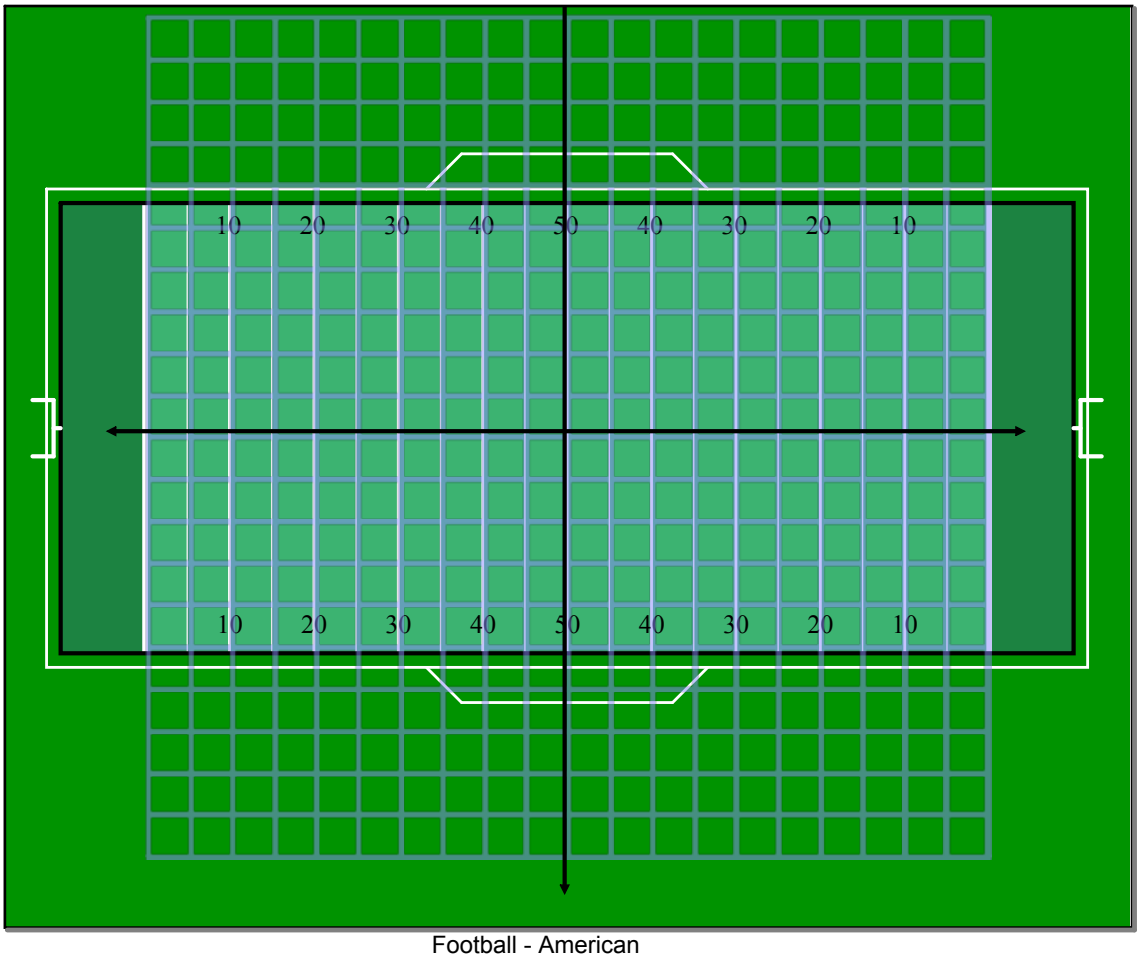


Football - American

Soccer balls for additional examples

Aug 31-3:00 PM

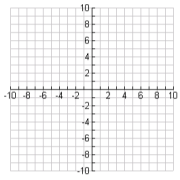
Solving Systems of Equations

Name_____ **Date**_____ **Period**_____

A. Graphing
Solve the system of equations by graphing.

$y = 2x - 4$

$y = \frac{-3}{2}x + 3$



B. Substitution
Use the substitution method to solve the following system of equations.

1. $y = x - 3$
   $x + y = 5$

2. $4x + 3y = 13$
   $x + y = 4$

C. Elimination
Using the elimination method, solve the following system of equations.

1. $2x + 3y = 18$
   $5x - y = 11$

3. $2x + 4y = 40$
   $7x - 3y = 4$

Solving Systems of Equations

Practice: Show all work.

Solve each of the following systems of equations. (choose any method)

1. $y = x + 7$
   $y = 4$

2. $2x - y = -7$
   $3x + 2y = -14$

3. $2x + 2y = 4$
   $x = 10 - 3y$

4. $x + 3y = 7$
   $2x - 3y = -4$

5. $x - y = -3$
   $2x + 3y = -6$

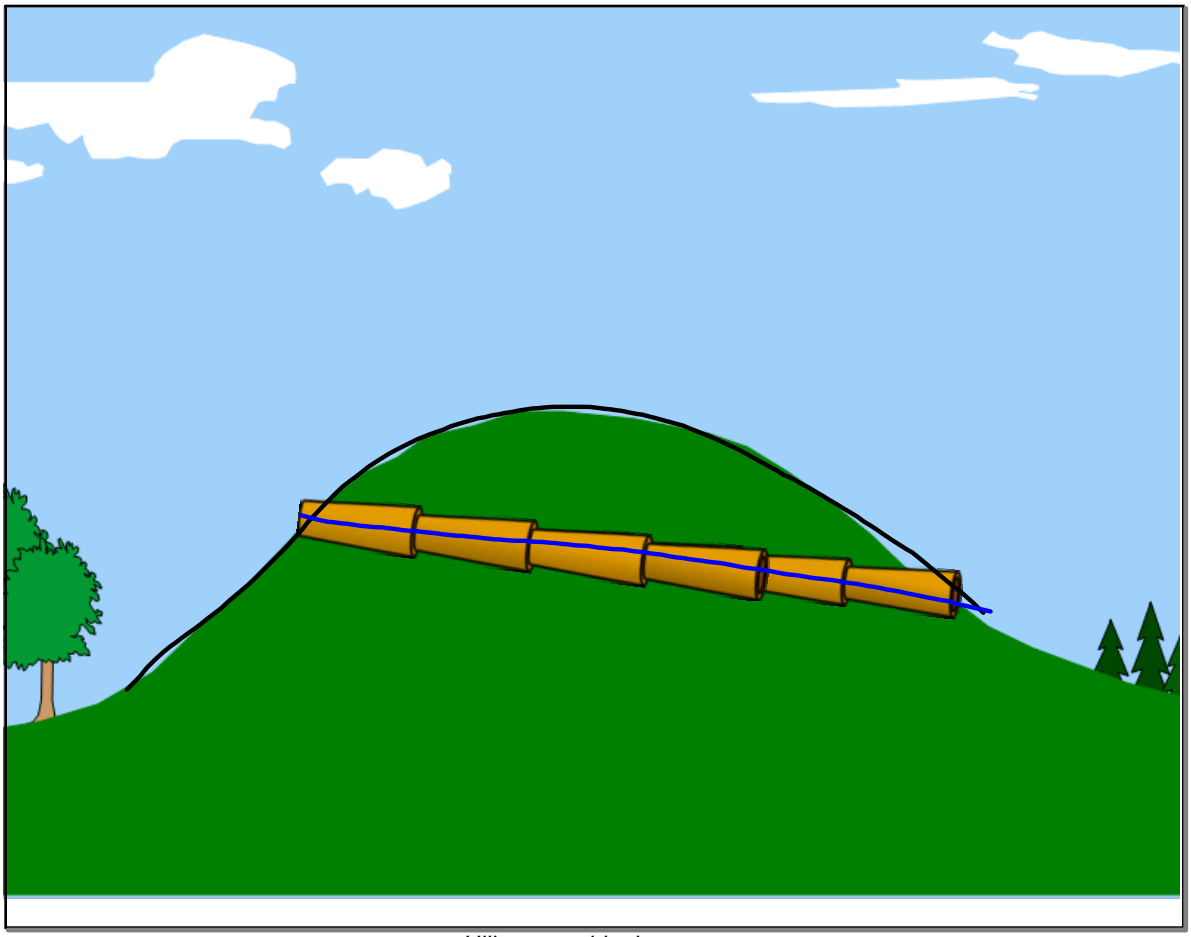
6. $x = 2y + 5$
   $3x - 6y = 15$

7. $x + 2y = 3$
   $5x - 3y = 2$

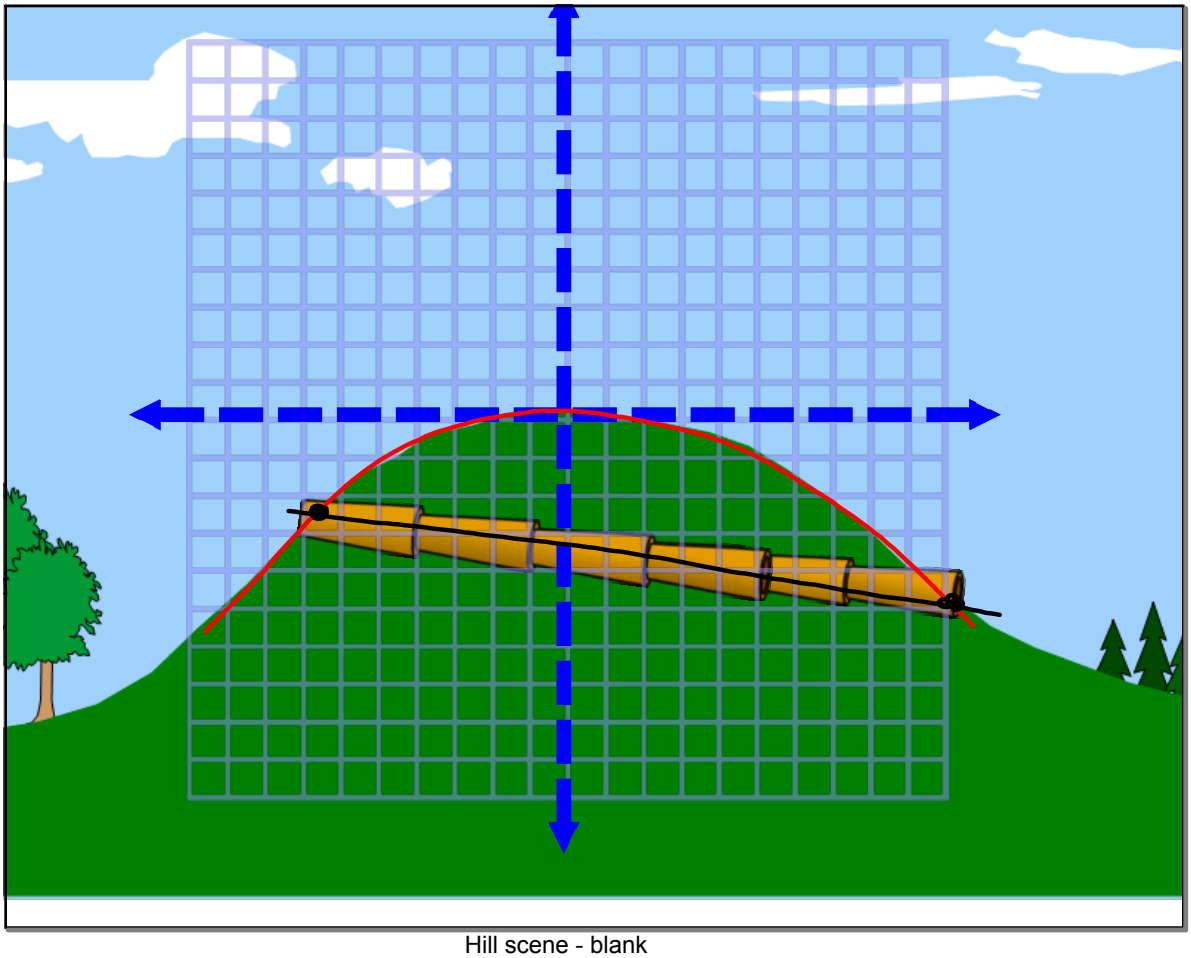
8. $2x + 4y = 40$
   $7x - 3y = 4$

9. $5x + 3y = 17$
   $5x - 2y = -3$

10. $x + 3y = 0$
    $x + 4y = 10$



Hill scene - blank



Hill scene - blank

What are the possible intersections?

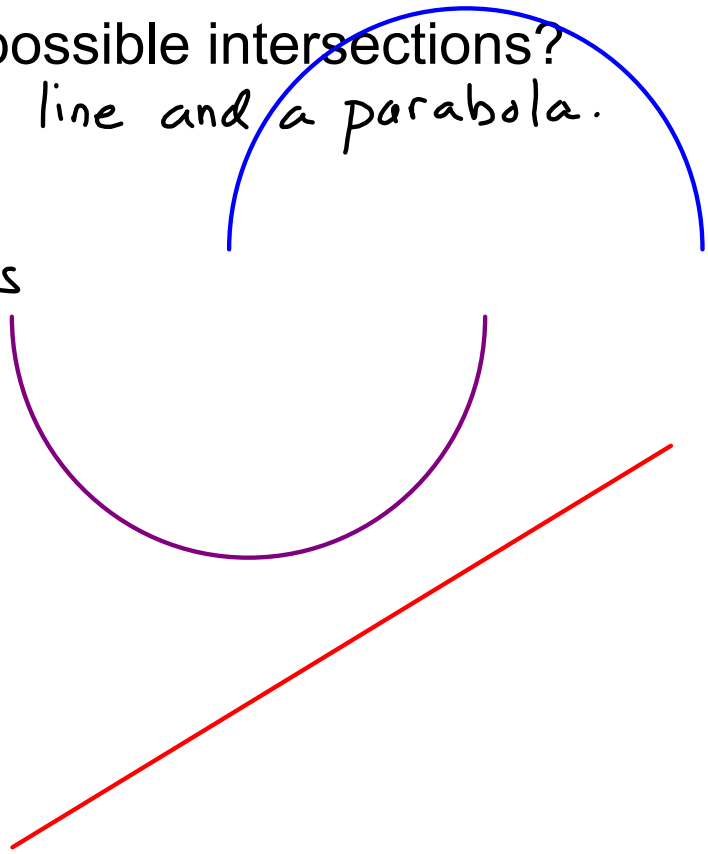
between a line and a parabola.

Possible Intersections

1

2

or none



Sep 14-6:16 PM

Ways to solve the intersection of a linear function and a quadratic function...

1. Algebraically substitution

2. Graphically

Sep 14-6:22 PM

Solving Algebraically

1. Set the two equation equal to each other.
2. Solve for x.
   - GCF
   - Factor
   - Quadratic Formula
   - Solve if only an x or only an x^2
3. x = # , x = # ... must check solutions something like 5 = 3, which mean no solution

Sep 14-6:23 PM

Example 1

$$f(x) = \begin{cases} x^2 + 7x + 12 \\ x + 3 \end{cases}$$

$y = x^2 + 7x + 12$
$y = x + 3$

$(-3, 0)$
1 intersection

Use substitution

$x + 3 = x^2 + 7x + 12$

$x + 3 = x^2 + 7x + 12$
$-x \qquad -x$

$3 = x^2 + 6x + 12$
$-3 \qquad -3$

$0 = x^2 + 6x + 9$

$1 \cdot 9$
$3 \cdot 3$

$0 = (x+3)(x+3)$

$x + 3 = 0$

$x = -3$

$= 0$
$= 9 + -21 + 12$
$= 3^2 + 7(-3) + 12$
$y = -3 + 3$
$y = 0$

Sep 14-6:28 PM

Sep 14-6:32 PM

Example 2

$$f(x) = \begin{cases} x^2 - 4 \\ 2x - 4 \end{cases}$$

$2x - 4 = x^2 - 4$

$-2x \qquad -2x$

$-4 = x^2 - 2x - 4$

$+4 \qquad +4$

$0 = x^2 - 2x$

$0 = (x)(x-2)$

$x = 0 \quad x - 2 = 0$

$x = 2$

$(0, -4)$

$x = 0$

$y = x^2 - 4 \quad y = 2x - 4$

$y = -4 \quad y = -4$

$x = 2$

$2^2 - 4 \quad 2(2) - 4$

$4 - 4 \quad 4 - 4$

$0 \quad 0$

$(2, 0)$

Sep 14-6:39 PM

Example 3

$$f(x) = \begin{cases} x^2 + x - 6 \\ x - 5 \end{cases}$$

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Attachments

WKS 2.1 = practice-study.pdf