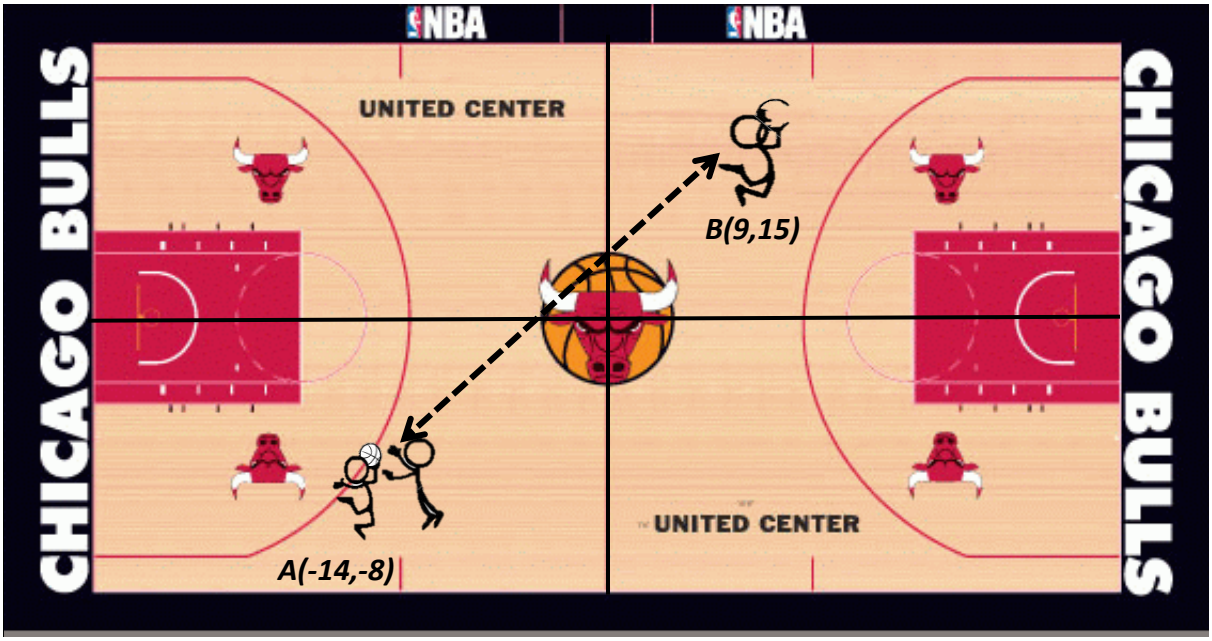
Math 2 **A.REI.7**

Assessment Title: Basketball
Unit 3: Quadratic Functions Representations

Learning Targets:

- I can solve a system of equations involving a linear and quadratic equation.

The Bulls get a Turn Over…and the crowd goes wild!!! (hhhhaaaaaaaaaaaaaaaa!)



Boozer steals the ball from the other team and dribbles across the circle to score the winning shot. Boozer's location for the turnover and the winning shot are indicated above.

a. Given that the radius of the center circle is 6 feet, and center court is at the origin, represent this situation on a coordinate plane by graphing the exact circle and line Boozer traveled.

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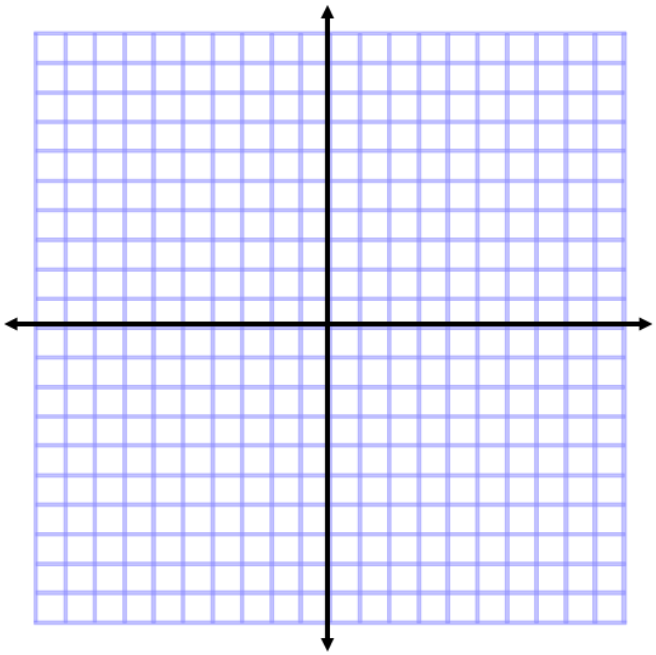

b. Write the equation of the line Boozer traveled.

c. Given that the equation of the center circle is $x^2 + y^2 = 36$, at which two points does Boozer cross the circumference of the center circle?

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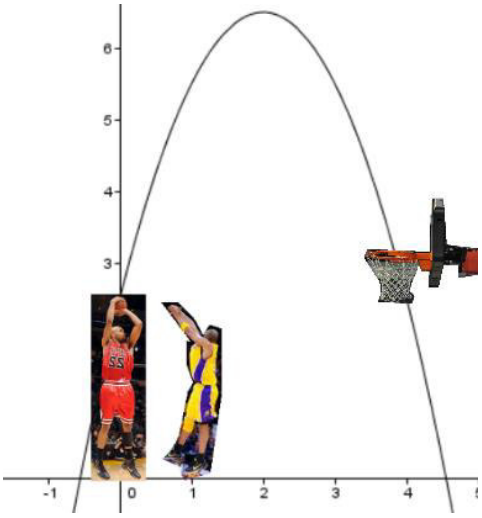
After Boozer got the turnover, he runs in for a shot and goes for a jump shot. When he shoots the ball, it travels along the path$h(t) = -t^2 + 4t + 2.25$ where t is horizontal distance (in meters) of the ball from Boozer.

d. If Kobe Bryant is 1 m in front of Boozer and Kobe can reach 2.5 m high without jumping, write an equation of a line that Kobe would need to block the ball and not goaltend.



e. Now that you have the line that Kobe jumps, what are the intersections of Kobe's path and the path of the ball?

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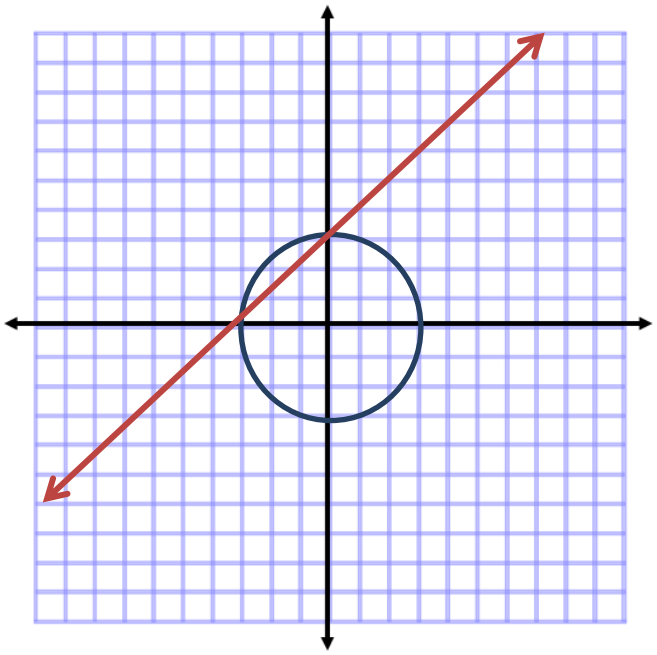
- **Standards Covered:** A.REI.7, A.CED.1



a)

b) y = x + 6

c) (0,6) and (-6,0)

d) Answers may vary. (e.g., $y = -3x + \frac{11}{2}$ What you are looking for is a line that intercepts the arc before the vertex.)

e) This will also depend on what linear equation they give in answer d. Again, as long as the point on the ball's path is before the vertex, they are good. (e.g. $(\frac{1}{2}, 4)$)