

5.3 PROJECT

THE NBA AND SHOT DISTRIBUTION

In this project, you will use systems of linear equations and basketball statistics to take a partial set of information to find additional specific details.

During the 2020–21 season², the teams in the National Basketball Association (NBA) averaged taking 88.4 shots per game (the 3-point shots attempted plus the 2-point shots attempted). The teams scored an average of 112.1 points per game with 17 of those points coming from free throws. The average shooting percentages were 36.7% for 3-point shots and 53% for 2-point shots.

7. Letting x be the average number of 3-point attempts per game, write an expression to describe the total points made from 3-point shots.
8. Letting y be the average number of 2-point attempts per game, write an expression to describe the total points made from 2-point shots.
9. Use the expressions from parts 1 and 2 to set up a system of linear equations: one equation to describe the number of shots taken and one equation to describe the average number of points scored. (**Note:** Free throws should not be included in the total number of points since we are only considering 3-point shots and 2-point shots.)
10. Solve the system of equations from part 3 to find the average number of 3-point shots attempted and the average number of 2-point shots attempted.

The highest scoring team in the league during the 2020–21 season averaged making 44.7 shots per game and scoring 120.1 points per game with 16.2 of those points coming from free throws. This team averaged taking 37.1 3-point shots and 54.7 2-point shots.

11. Letting a be the percentage of 3-point attempts made per game (as a decimal), write an expression to describe the total number of points scored from 3-point shots.
12. Letting b be the percentage of 2-point attempts made per game (as a decimal), write an expression to describe the total number of points scored from 2-point shots.
13. Use the expressions from parts 5 and 6 to set up a system of linear equations: one equation for the total number of shots made and one equation for the total number of points scored. (Again, note that free throws should not be included in the total number of points since we are only considering 3-point and 2-point shots.)
14. Solve the system of equations from part 7 to find the percent of 3-point shots made per game and the percent of 2-point shots made per game.