




APPC Lesson 3.4 Homework

Name _____

-  1. A home goods store sells trashcans in the shape of a cylinder. The trashcans are twice as high as they are wide and come in various sizes. Let $V(d)$ represent the volume of a trashcan with a diameter of d inches.
 - a. What type of function could be used to model v ? Explain.
 - b. What is an appropriate domain for V ? Explain.

-  2. A coffee store chain wants to expand and plans to add three new locations each month. What type of function could be used to model the number of coffee stores after x years? Justify your answer.


-  3. The average annual fruit consumption per person, in the time period from 1990 through 2020 is given in the table. Is the data best modeled by a linear, quadratic, or cubic function? How do you know?

Year	Average annual fruit consumption (kg)
1990	48.90
1995	54.21
2000	59.82
2005	65.40
2010	68.76
2015	74.42
2020	77.13

 MATH MEDIC


4. In a recreational volleyball tournament, each team in the league plays every other team in the league exactly twice. What type of function could be used to model the number of games played $g(n)$, if there are n teams in the league? Explain.
5. Carleigh will drive 170 miles for a work conference. If her average speed is s miles per hour, which type of function best models $T(s)$, the time it will take her to drive to the conference location?
- A) Linear function
 - B) Square root function
 - C) Rational function
 - D) Quadratic function
6. The number of daily visitors to a theme park has increased significantly as new rides, attractions, and experiences are introduced. Information about the average number of daily visitors over a 7-year span is given in the table below. What type of function best models how the number of daily visitors is growing? Explain.

Year	Number of Daily Visitors
1	1000
2	2195
3	4097
4	6861
5	10651
6	15627
7	21956

 7. The average annual salary of a beginning full-time teacher is a function of the country's GDP per capita. As GDP per capita increases, so does the average annual salary. However, each consecutive increase of \$10,000 in GDP per capita results in a smaller increase in the average annual salary.

a. Why might this be the case?

b. According to this information, does there seem to be a linear relationship between a country's GDP per capita and the average annual starting salary of a teacher? If not, what type of function might better describe this relationship?

-  8. The following excerpts are taken from an article titled “When will the world reach ‘peak child’?” published by ourworldindata.org and written by Max Roser.

“Since 1950 the total number of children younger than 15 years of age increased rapidly, from 0.87 billion children to 1.96 billion today.”

“With a much lower global fertility rate... the number of children will rise only very slowly and will barely increase at all over the coming century. The UN expects the number of children to peak in 2057 at 2.09 billion children and by the end of the century the number of children will be basically the same as today (just below 2 billion in the UN forecast).”

“Since the middle of the 20th century the number of school-age-children increased by 125% . From today to the peak number of children, the number of children will only increase by 7% . If these projections are correct, then the world is not quite at ‘peak child’ yet, but we are approaching a flat plateau.”

Use the information provided to answer the following questions:

- a. What type of function do you think could be used to describe the number of school-age-children between 1950 to today? Explain your reasoning.
- b. What type of function do you think could be used to model the number of school-age-children between today and the end of the century? Explain your reasoning.
- c. What type of function do you think could be used to model the number of school-age-children in the long run? Explain your reasoning.
- d. Why do you think the UN is trying to model the number of school-age-children in the next 50 years and beyond? Why might this information be valuable?