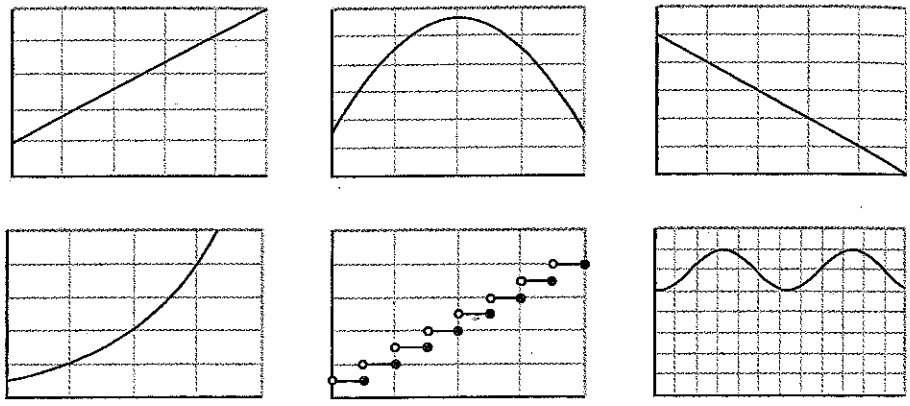
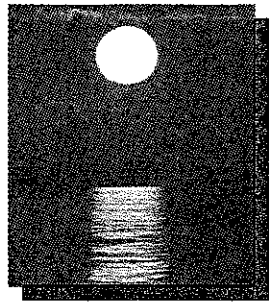
3. There are many important situations in which variables are related by a function. Here are graphs and descriptions of several such situations. Match the descriptions to the graphs that seem to fit best. Then for each situation, describe the following:
   - The sorts of numerical values you would expect for each variable
   - A reasonable domain and range for each function
   - The function family (if any) that would probably provide a good modeling rule



a. When a football team's punter kicks the ball, the ball's height changes as time passes from kick to catch. What pattern seems likely to relate time and height?

b. The senior class officers at Lincoln High School decided to order and sell souvenir baseball caps with the school insignia and name on them. One supplier said it would charge $100 to create the design and then an additional $4 for each cap made. How would the total cost of the order be related to the number of caps in the order?

c. The number of hours between sunrise and sunset changes throughout the year. What pattern seems likely to relate time and hours of sunlight?



d. In planning a bus trip to Florida for spring break, a travel agent worked on the assumption that each bus would hold at most 40 students. How would the number of buses be related to the number of student customers?

e. When the Lincoln High School sophomore class officers decided to order and sell T-shirts with the names of everyone in their class on the shirts, they checked with a sample of students to see how many would buy a T-shirt at various proposed prices. How would sales be related to price charged?

f. The population of the world has been increasing for as long as records have been available. What pattern of population growth has occurred over that time?