Notes

**Definition: Average Rate of Change**

1. The table below shows the number of deaths in motor vehicle accidents in the United States as listed by the U.S. Bureau of the Census.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 1980 | 1990 | 2000 | 2005 | 2007 |
| Number of deaths (in thousands) | 51.1 | 44.6 | 41.9 | 43.5 | 41.1 |

* 1. Define the independent and dependent variables.
  2. Do you expect the ARC between 1980 and 2000 to be positive or negative? Explain.
  3. Calculate the average rate of change between 1980 and 2000.
  4. Interpret the answer from part c.
  5. Calculate the average rate of change between 2000 and 2005.
  6. Interpret the answer from part e.

1. Given the following graphs, circle the answer to the questions below.

|  |
| --- |
| Graph A |
|  |

1. The function in graph A is

|  |  |
| --- | --- |
| Increasing | Decreasing |

1. The average rate of change between sequential equal size

intervals for graph A is

|  |  |  |
| --- | --- | --- |
| Increasing | Decreasing | Constant |

|  |
| --- |
| Graph B |
|  |

1. The function in graph B is

|  |  |
| --- | --- |
| Increasing | Decreasing |

1. The average rate of change between sequential equal size

intervals for graph B is

|  |  |  |
| --- | --- | --- |
| Increasing | Decreasing | Constant |

|  |
| --- |
| Graph C |
|  |

1. The function in graph C is

|  |  |
| --- | --- |
| Increasing | Decreasing |

1. The average rate of change between sequential equal size

intervals for graph C is

|  |  |  |
| --- | --- | --- |
| Increasing | Decreasing | Constant |

|  |
| --- |
| Graph D |
|  |

1. The function in graph D is

|  |  |
| --- | --- |
| Increasing | Decreasing |

1. The average rate of change between sequential equal size

intervals for graph D is

|  |  |  |
| --- | --- | --- |
| Increasing | Decreasing | Constant |

1. What can be said about the average of change for a function whose graph is a straight line?
2. Given the tables below, determine which functions are linear.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** | ***f(x)*** |  | ***x*** | ***g(x)*** |  | ***x*** | ***h(x)*** |  | ***x*** | ***j(x)*** |
| −1 | 9 |  | 0 | 10 |  | −4 | ¼ |  | 0 | 2 |
| 0 | 7 |  | 1 | 12 |  | −2 | ½ |  | 1 | 6 |
| 1 | 5 |  | 2 | 15 |  | 0 | ¾ |  | 4 | 18 |
| 2 | 3 |  | 3 | 19 |  | 2 | 1 |  | 6 | 26 |

1. Given the following scenarios, determine whether the function is linear. Explain your reasoning.
   1. The initial population of deer is 10 and the population doubles every year.
   2. The initial population of frogs is 10 and each year there are 5 more frogs.

**Definition: Linear Function**

1. For each table in #5 that you determined to be linear, write the equation that represents this linear function.