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Name:

F.IF.B.6: Rate of Change 3

1 The population of Austin, Texas from 1850 to 2010 is summarized in the table below.

| Year | 1850 | 1870 | 1890 | 1910 | 1930 | 1950 | 1970 | 1990 | 2010 |
|------------|------|------|--------|--------|--------|---------|---------|---------|---------|
| Population | 629 | 4428 | 14,575 | 29,860 | 53,120 | 132,459 | 251,808 | 494,290 | 790,390 |

Over which period of time was the average rate of change in population the greatest?

| 1) | 1850 to 1910 | 3) | 1950 to 1970 |
|----|--------------|----|--------------|
| 2) | 1990 to 2010 | 4) | 1890 to 1970 |

2 A cardboard box manufacturing company is building boxes with length represented by x + 1, width by 5 - x, and height by x - 1. The volume of the box is modeled by the function below.



3) [1,5]

Over which interval is the volume of the box changing at the fastest average rate?

- 1) [1,2]
- 2) [1,3.5] 4) [0,3.5]

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3 Irma initially ran one mile in over ten minutes. She then began a training program to reduce her one-mile time. She recorded her one-mile time once a week for twelve consecutive weeks, as modeled in the graph below.



Which statement regarding Irma's one-mile training program is correct?

- 1) Her one-mile speed increased as the number of weeks increased.
- 3) If the trend continues, she will run under a six-minute mile by week thirteen.
- 2) Her one-mile speed decreased as the number of weeks increased.
- 4) She reduced her one-mile time the most between weeks ten and twelve.
- 4 Consider the graph of g and the table representing t below.



Over the interval [2,4], which statement regarding the average rate of change for g and t is true?

- 1) *g* has a greater average rate of change.
- 2) The average rates of change are equal.
- 3) The average rate of change for *g* is twice the average rate of change for *t*.
- 4) The average rate of change for g is half the average rate of change for t.

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5 The distance needed to stop a car after applying the brakes varies directly with the square of the car's speed. The table below shows stopping distances for various speeds.

| Speed (mph) | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
|----------------------|------|----|-------|-----|--------|-----|--------|
| Distance (ft) | 6.25 | 25 | 56.25 | 100 | 156.25 | 225 | 306.25 |

Determine the average rate of change in braking distance, in ft/mph, between one car traveling at 50 mph and one traveling at 70 mph. Explain what this rate of change means as it relates to braking distance.

6 Determine the average rate of change, in mph, from 2 to 4 hours on the graph shown below.



F.IF.B.6: Rate of Change 3 Answer Section

1 REF: 062301aii 2 REF: 011724aii 3 REF: 061904aii 4 REF: 062212aii 5 REF: 081631aii 6 REF: 082225aii