Name Schlansky
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Date _____
Algebra II

Average Rate of Change with Intervals

1. Firing a piece of pottery in a kiln takes place at different temperatures for different amounts of time. The graph below shows the temperatures in a kiln while firing a piece of pottery after the kiln is preheated to 200°F.
During which time interval did the temperature in the kiln show the greatest average rate of change?

1) 0 to 1 hour
2) 1 hour to 1.5 hours
3) 2.5 hours to 5 hours
4) 5 hours to 8 hours

0 to 1

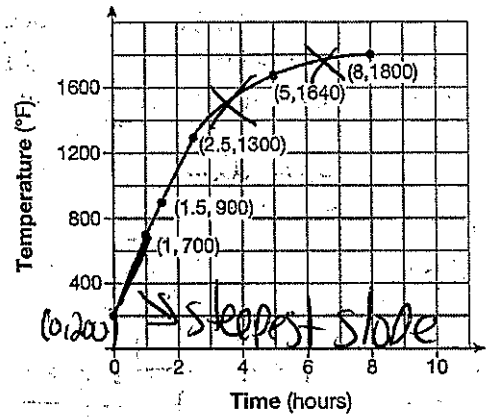
x	y
0	200
1	700

$\frac{700-200}{1-0}$ (500)

1 to 1.5

x	y
1	700
1.5	900

$\frac{900-700}{1.5-1}$ (400)



2. The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.

During which interval was their average speed the greatest?

1) the first hour to the second hour
2) the second hour to the fourth hour
3) the sixth hour to the eighth hour
4) the eighth hour to the tenth hour

1 to 2

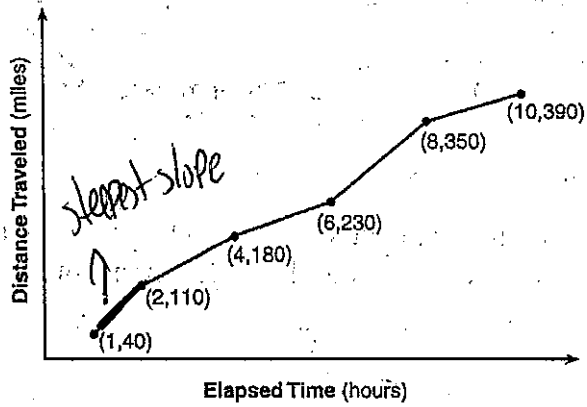
x	y
1	40
2	110

$110-40$ / $2-1$ (70)

6 to 8

x	y
6	230
8	350

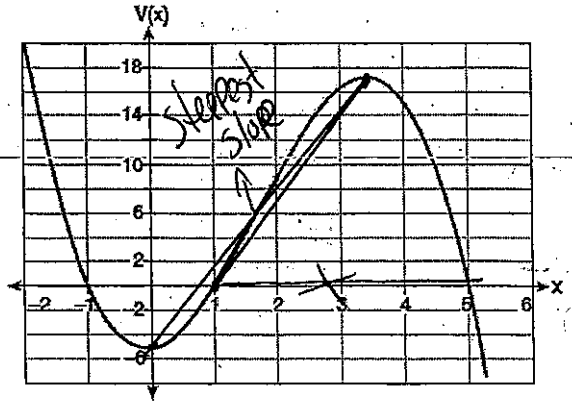
$350-230$ / $8-6$ (60)



3. 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.

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

1) [1,2]
2) [1,3.5]
3) [1,5]
4) [0,3.5]



4. The table below shows the year and the number of households in a building that had high-speed broadband internet access.

Number of Households	11	16	23	33	42	47
Year	2002	2003	2004	2005	2006	2007

For which interval of time was the average rate of change the *smallest*?

1) 2002 - 2004
2) 2003 - 2005
3) 2004 - 2006
4) 2005 - 2007

1) X | Y
2002 | 11
2004 | 23

$\frac{23-11}{2004-2002} = 6$

2) X | Y
2003 | 16
2005 | 33

$\frac{33-16}{2005-2003} = 8.5$

3) X | Y
2004 | 23
2006 | 42

$\frac{42-23}{2006-2004} = 9.5$

4) X | Y
2005 | 33
2007 | 47

$\frac{47-33}{2007-2005} = 7$

5. Joelle has a credit card that has a 19.2% annual interest rate compounded monthly. She owes a total balance of B dollars after m months. Assuming she makes no payments on her account, the table below illustrates the balance she owes after m months.

m	B
0	1000.00
10	1172.00
19	1352.00
36	1770.80
60	2591.90
69	2990.00
72	3135.80
73	3186.00

1) $\frac{2591.90 - 1172}{60-10} = 28.398$

2) $\frac{2990 - 1352}{69-19} = 32.76$

3) $\frac{3135.80 - 1770.80}{72-36} = 37.916$

4) $\frac{3186 - 2591.90}{73-60} = 45.7$

Over which interval of time is her average rate of change for the balance on her credit card account the greatest?

1) month 10 to month 60
2) month 19 to month 69
3) month 36 to month 72
4) month 60 to month 73

6. The function $N(t) = 100(2.6)^{-0.023t}$ models the number of grams in a sample of cesium-137 that remain after t years. On which interval is the sample's average rate of decay the fastest?

1) [1, 10]
2) [10, 20]
3) [15, 25]
4) [1, 30]

1) X | Y
1 | 97.826
10 | 80.271

$\frac{80.271 - 97.826}{10-1}$

2) X | Y
10 | 80.271
20 | 64.434

$\frac{64.434 - 80.271}{20-10}$

3) X | Y
15 | 71.917
25 | 57.729

$\frac{57.729 - 71.917}{25-15}$

4) X | Y
1 | 97.826
30 | 51.721

$\frac{51.721 - 97.826}{30-1}$