

LESSON
10-3

Problem Solving

Rate of Change and Slope

Write the correct answer.

1. The table shows the cost per pound of Granny Smith apples.

| | | | | |
|--------------------|------|------|------|------|
| Weight (lb) | 1 | 2 | 3 | 4 |
| Cost (\$) | 1.49 | 2.98 | 4.47 | 5.96 |

Describe the rate(s) of change shown by the data.

3. The table shows the distance of a courier from her destination.

| | | | | |
|----------------------|------|------|------|------|
| Time (p.m.) | 2:15 | 2:30 | 2:45 | 3:00 |
| Distance (mi) | 5.4 | 5.4 | 5.0 | 0.5 |

What is the rate of change from 2:15 p.m. to 2:30 p.m.? What does this rate of change mean?

2. The table shows Gabe's height on his birthday for five years. Find the rate of change during each time interval.

| | | | | | |
|---------------------|----|------|------|----|----|
| Age | 9 | 11 | 12 | 13 | 15 |
| Height (in.) | 58 | 59.5 | 61.5 | 65 | 69 |

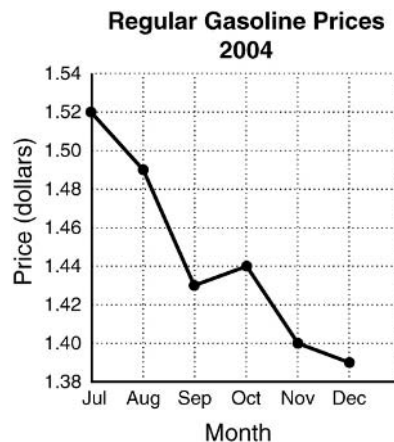
When did the greatest rate of change occur? _____

When was the rate of change the least? _____

During which two time periods were the rates of change the same? _____

The graph below tracks regular gasoline prices from July 2004 to December 2004. Use the graph to answer questions 5–7. Select the best answer.

4. What is the slope of the line from November to December?
- A -4 C -0.04
B -1 D -0.01
5. During which time interval did the cost decrease at the greatest rate?
- F Jul to Aug H Sep to Oct
G Aug to Sep J Oct to Nov
6. During which time interval was the slope positive?
- A Jul to Aug C Sep to Oct
B Aug to Sep D Oct to Nov



7. What was the rate of change from October to December?
- F -0.05 H 0.025
G -0.025 J 0.05

Problem Solving

1. The rate of change has a constant value of 1.49.
2. 9–11: 0.75; 11–12: 2;
12–13: 3.5; 13–15: 2;
12–13; 9–11; 11–12 and 13–15
3. 0; she was not moving during this time.
4. D
6. C
5. G
7. G

Reading Strategies

1. temperature
2. time
3. $\frac{12}{3} = 4$; $\frac{4}{2} = 2$; $\frac{4}{4} = 1$
4. upward is vertical and the y -axis is the vertical axis.
5. people run horizontally and the x -axis is the horizontal axis.
6. $-\frac{2}{3}$

10-4 THE SLOPE FORMULA

Practice A

1. 9; 3; 6
2. $\frac{-1 - 3}{2 - (-2)}$; $\frac{-4}{4}$; -1
3. $\frac{-2 - 6}{0 - 4}$; $\frac{-8}{-4}$; 2
4. $-\frac{2}{3}$
5. -2
6. $\frac{7}{3}$
7. 2; the profit increases \$2 for every box sold.
8. $\frac{3}{2}$; For each additional crust made, 1.5 cups of flour are needed.
9. a. 0;
2x;
2; 2
-5
c. -5; -2;
-2; -5; $\frac{-2}{5}$
b. 0;
5y;
5; 5
-2

Practice B

1. $\frac{-3 - 8}{1 - 2}$; $\frac{-11}{-1}$; 11
2. $\frac{-2 - 0}{-6 - (-4)}$; $\frac{-2}{-2}$; 1
3. $\frac{-7 - (-2)}{4 - 0}$; $\frac{-5}{4}$
4. $\frac{3}{5}$
5. 1.25
6. $-\frac{3}{4}$
7. $\frac{3}{2}$; the salary increases \$3 every 2 years.
8. $-\frac{400}{3}$; the number of people remaining decreases by 400 every 3 hours.
9. $-\frac{3}{4}$
10. $\frac{8}{3}$

Practice C

1. 4
2. $\frac{5}{7}$
3. $\frac{1}{5}$
4. 3
5. 0
6. 3
7. $\frac{4}{5}$
8. $\frac{2}{5}$
9. $-\frac{1}{2}$
10. $-\frac{50}{3}$; the number of remaining pages decreases by 50 every 3 days.
11. $\frac{1}{10}$; one quart of syrup can be made for every 10 gal of sap.
12. $\frac{7}{6}$
13. $-\frac{5}{2}$
14. $\frac{1}{4}$
15. 4
16. 2
17. 6