

4.4b Warm-Up:

Read the rate of change paragraph on p 237.

Write down some examples of rate of change.
(New or from last time.)

¢/\$

\$/hr

m + m's / bag

days / mo

mpg

The table shows the distance a person walks for exercise. Find the rate of change in distance with respect to time.

Time (minutes)	Distance (miles)
30 x_1	1.5 y_1
60 x_2	3 y_2
90	4.5

change in distance

change in time

$$\frac{3 - 1.5}{60 - 30} = \frac{1.5 \text{ mi}}{30 \text{ min}}$$

unit rate: .05 mi / 1 min.

$$\frac{4.5 - 1.5}{90 - 30} = \frac{3 \text{ mi}}{60 \text{ min}} = \frac{1 \text{ mi}}{20 \text{ min}}$$

$$\frac{1.5 \div 1.5}{30 \div 1.5} = \frac{1}{20}$$

The table shows the cost to paint a house for a given number of hours. Find the rate of change in cost with respect to time.

Time (hours)	4	6	8
Cost (\$)	90	135	180

$$\frac{135 - 90}{6 - 4} = \frac{\$45}{2 \text{ hr}} = \boxed{\$22.50/\text{hr}}$$

Find the value of y so that the line passes through the points $(5, 4)$ and $(-5, y)$ has a slope of $3/5$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - y}{5 - (-5)} = \frac{4 - y}{10}$$

$$\frac{3}{5} = \frac{4 - y}{10}$$
$$5(4 - y) = 3 \cdot 10$$
$$20 - 5y = 30$$
$$-5y = 10$$
$$y = -2$$

Find the value of x so that the line passes through the points $(x, 9)$ and $(-1, 19)$ has a slope of 5.

$$x_2, y_2 \quad x_1, y_1$$

$$\frac{19-9}{-1-x} = 5$$

$$\frac{10}{-1-x} = 5$$

$$10 \cdot 1 = 5(-1-x)$$

$$10 = -5 - 5x$$

$$15 = -5x$$

$$-3 = x$$

Rate of change examples:

eggs per cake

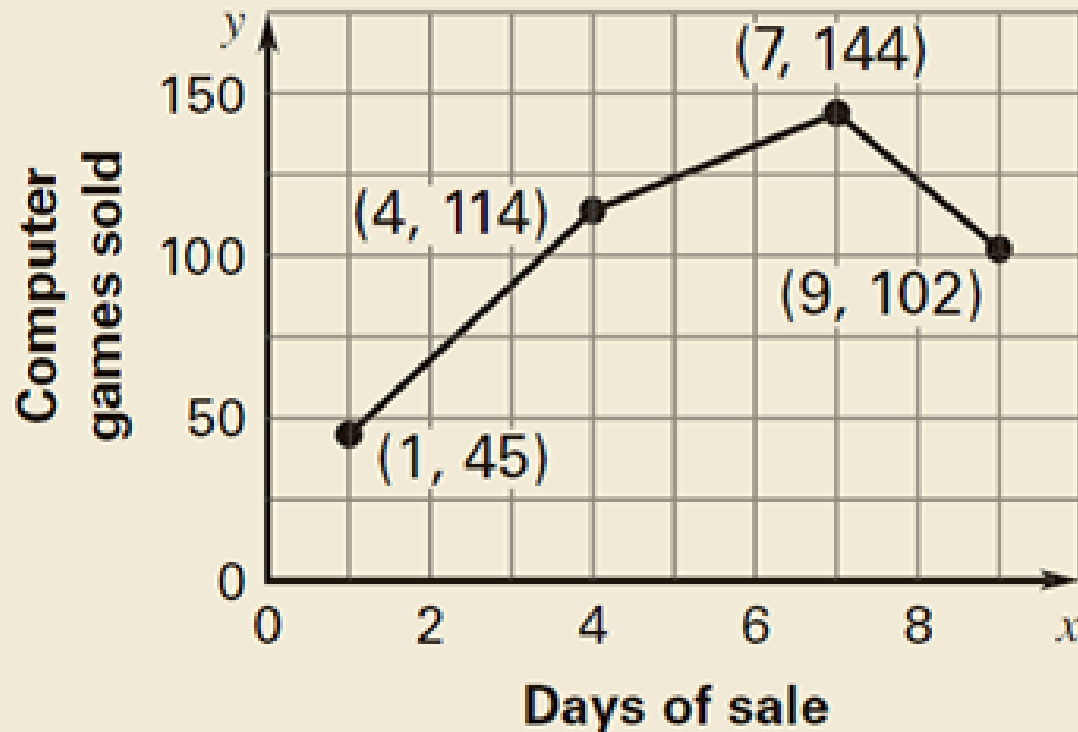
pencils per pack

\$ per hour

weight gain per year

All examples can be represented with a graph.

The graph shows the number of computer games sold day 1, day 4, day 7, and day 9 of a sale. Describe the rates of change in sales with respect to time.



Day 1-4

high sales
over time

Day 4-7

Sales still ↑
but not as
much.

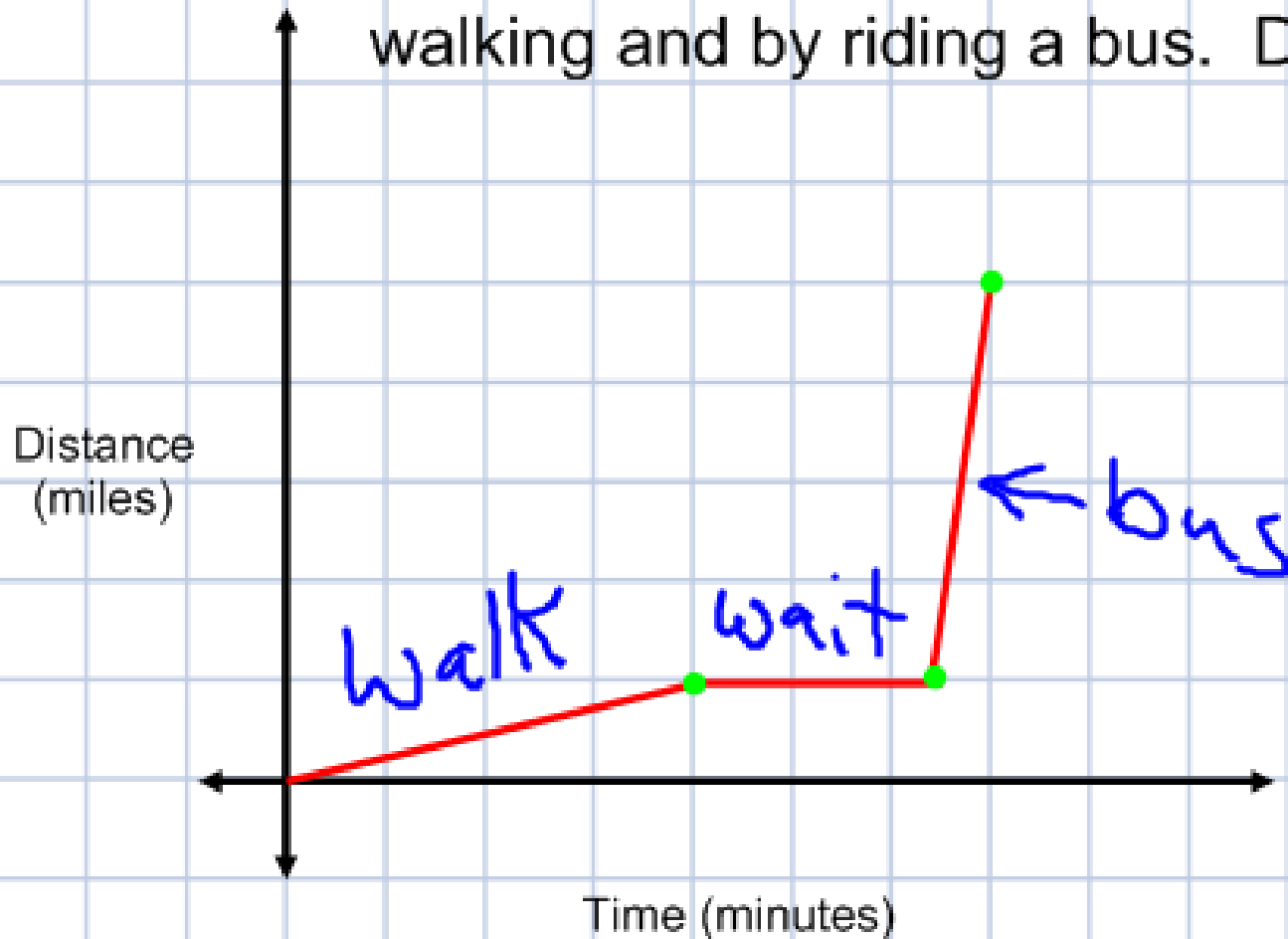
Day 7-9

Sales decreasing

Interpret a graph

(what does the graph really mean?)

A student commutes from home to school by walking and by riding a bus. Describe this commute



Homework:

pp240-1

#'s 19-27, 36-38, 57-62