Algebra 1 Unit 3 worksheet: Average rate of change from a table or graph

Name _____ Date _____ Period _____

1. Each cell gives a function's values at two inputs. Find the average rate of change of the function over the interval between the two inputs.

(a) $f(3) = 10$, $f(7) = 30$

(b) $g(-2) = 9$, $g(4) = -3$

(c) $h(0) = 1.5$, $h(5) = 4$

(d) $k(-6) = -4$, $k(-1) = -4$

(e) $p(10) = 2$, $p(4) = 11$

(f) $q(-3) = -7$, $q(9) = 2$

2. Sarah measures a bean plant every two weeks. The table gives its height $H(w)$, in centimeters, w weeks after planting.

w **(weeks)**	0	2	4	6	8
$H(w)$ (cm)	10	16	22	25	26

(a) Find the average rate of change of H from week 0 to week 4, with its units.

(b) Find the average rate of change of H from week 4 to week 8.

(c) Find the average rate of change of H from week 0 to week 8. How is it related to your answers to (a) and (b)?

Free sample from math.wiki for classroom use. Do not post. math.wiki

3. The table gives the air temperature $T(h)$, in degrees Celsius, h hours after midnight on a summer day.

h **(hours)**	15	17	19	21	23
$T(h)$ (°C)	24	22	17	13	11

Priya worked out the average rate of change of T from $h = 17$ to $h = 23$ like this:

$$\frac{22 - 11}{23 - 17} = \frac{11}{6} \approx 1.83$$

She says the air warmed by about 1.83 degrees an hour on average.

(a) What did Priya do wrong?

(b) Find the correct average rate of change from $h = 17$ to $h = 23$, and say what it means.

(c) Find the average rate of change from $h = 15$ to $h = 19$ and from $h = 19$ to $h = 23$. In which of these four-hour stretches did the air cool faster, on average?

4. Hannah lets go of a weather balloon. At $t = 6$ seconds it is 80 meters above the ground. At a later time, $t = b$ seconds, it is 107 meters above the ground. The average rate of change of its height from $t = 6$ to $t = b$ is 9 meters per second. Find b.

Free sample from math.wiki for classroom use. Do not post. math.wiki

5. A train leaves a station at noon. Its distance from the station has an average rate of change of 30 kilometers per hour over the first 2 hours, and of 60 kilometers per hour over the next 4 hours. Diego says its average rate of change over all 6 hours is $\frac{30+60}{2} = 45$ kilometers per hour.

(a) How far did the train travel in each of the two stretches?

(b) Find the correct average rate of change over all 6 hours.

(c) Explain why Diego's method gave the wrong answer, and say when taking the mean of two averages would work.

6. A function f has these values, where k is a number.

x	1	3	5
$f(x)$	4	k	16

(a) Find k if the average rate of change of f from $x = 1$ to $x = 3$ is twice its average rate of change from $x = 3$ to $x = 5$.

(b) Find the value of k that makes the average rate of change from $x = 1$ to $x = 3$ equal to the one from $x = 3$ to $x = 5$.

(c) With the value of k from (b), does the table show that f is linear? Explain.

Free sample from math.wiki for classroom use. Do not post. math.wiki