THINKING WRITING

12.A Equations from Data

Each of the tables below gives four (x, y) pairs for a function. Each function is one of the following types and has an equation of the corresponding form.

Type of Function	Form of Equation
direct variation	$y = mx$
inverse variation	$y = k/x$
linear	$y = mx + b$

For each table in problems 1 through 6,

a. decide whether the function is direct variation, inverse variation, or linear;

b. find the equation of the function.

1.

x	y
0.05	5
0.5	0.5
5	0.05
50	0.005

2.

x	y
0.05	0.002
0.5	0.02
5	0.2
50	2

3.

x	y
0.9	0.6
1.5	1.0
2.7	1.8
5.1	3.4

4.

x	y
200	125
100	62.5
120	75
320	200

5.

x	y
0.01	0.73
0.1	0.55
1.5	-2.25
3	-5.25

6.

x	y
4	-2
8	-1
18	1.5
25	3.25

7. Each of the following three tests can be used to recognize a certain type of function among direct variations, inverse variations, and linear functions. Match the test to the type of function. Make sure your answer works for problems 1-6.

a. constant xy product

b. constant slope

c. constant y/x ratio

Because of measurement error, the numbers obtained in scientific experiments do not usually give perfect number patterns. For tables 8-10, find an equation that is approximately right.

8.

x	y
1.5	0.50
1.6	0.53
1.7	0.55
1.8	0.60
1.9	0.63
2.0	0.65

9.

x	y
12.5	6.8
13	6.5
13.5	6.3
14	6.1
14.5	5.9
15	5.6

10.

x	y
0.6	4.12
0.7	4.26
0.8	4.37
0.9	4.49
1.0	4.61
1.1	4.71

11. Report Summarize what you know about how to find the equation corresponding to experimental data, if it is one of the following types:

- direct variation
- linear function
- inverse variation

Include examples. Explain both how to recognize the type of function and how to find the actual equation.