*Ch. 7.5

Algebra 1 9.6

Identify linear, quadratic, and exponential* functions from data

Write equations that model data

linear $y = mx + B$

quadratic $y = ax^2$

exponential $y = a(b)^x$

difference

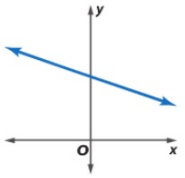
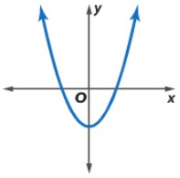
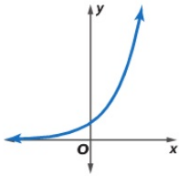
↓ 1st = linear

2nd = quad

ratio = exp.

Whiteboards

ConceptSummary Linear and Nonlinear Functions

Linear Function	Quadratic Function	Exponential Function
$y = mx + b$	$y = ax^2 + bx + c$	$y = ab^x$, when $b > 0$
		

11.

x	−3	−2	−1	0	1
y	1	1.5	2	2.5	3

.5 .5 .5 .5

$y = mx + B$

$y = .5x + B$

$3 = .5 \cdot 1 + B$

$3 = .5 + B$

$-.5 \quad -.5$

$2.5 = B$

$y = .5x + 2.5$

Whiteboards

10.

x	−5	−4	−3	−2	−1
y	125	80	45	20	5

-45 -35 -25 -15

10 10 10

→ -15 - -25

-25 - -35

-35 - -45

(2)

$y = ax^2$

$5 = a(-1)^2$

$5 = 1a$

$5 = a$

$y = 5x^2$

9.

x	−1	0	1	2	3
y	1	3	9	27	81

2 6 18 54

12 36

$3x = 5y$

$-5y \quad -5y$

$3x - 5y = 0$

mx my = #

WB 9.6

$b = 3$

$y = a(3)^x$

$a = 3$

$9 = a(3)^1$

$9/3 = 3a/3$

$y = 3(3)^x$

Real-World Example 4 Write an Equation for a Real-World Situation

BOOK CLUB **The table shows the number of book club members for four consecutive years. Determine which model best represents the data. Then write a function that models the data.**

Understand We need to find a model for the data, and then write a function.

Time (years)	0	1	2	3	4
Members	5	10	20	40	80

$y = a(2)^x$

$10 = a(2)^1$, $a = 5$

$y = 5(2)^x$

5 10 20 40

e ? $r = 2$

5 10 20

GuidedPractice

4. ADVERTISING The table shows the cost of placing an ad in a newspaper. Determine a model that best represents the data and write a function that models the data.

No. of Lines	5	6	7	8
Total Cost ($)	14.50	16.60	18.70	20.80

2.10 2.10 2.10

$y = 2.10x + 4$

$y = mx + B$

$y = 2.10x + B$

$14.50 = 2.10(5) + B$

$14.50 = 10.50 + B$

$-10.50 \quad -10.50$

$B = 4$

$$6xy + 3x = 4$$