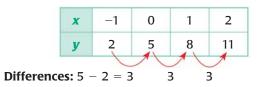
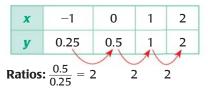
DIFFERENCES AND RATIOS A table of values represents a linear function if the *differences* of successive *y*-values are all equal. A table of values represents an exponential function if the *ratios* of successive y-values are all equal. In both cases, the increments between successive *x*-values need to be equal.

Linear function: y = 3x + 5

Exponential function: $y = 0.5(2)^{x}$





You can use differences to tell whether a table of values represents a quadratic function, as shown.

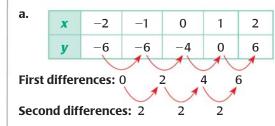
Quadratic function: $y = x^2 - 2x + 2$

-10 1 2 3 X 5 2 2 5 1 function is represented y ☐ First find the differences of successive by a table of values, be A y-values, or first differences. sure that the values of First differences: -3 3 2 **Control** Then find the differences of successive *x* are increasing by the Second differences: 2 2 first differences, or second differences.

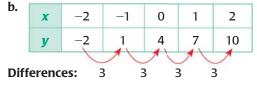
The table of values represents a quadratic function if the second differences are all equal.

EXAMPLE 2 Identify functions using differences or ratios

Use differences or ratios to tell whether the table of values represents a linear function, an exponential function, or a quadratic function.



The table of values represents a quadratic function.



The table of values represents a linear function.

CHECK VALUES

same amount.

..... When deciding what

OF *x*

GUIDED PRACTICE for Examples 1 and 2

- 1. Tell whether the ordered pairs represent a *linear function*, an *exponential function*, or a *quadratic function*: (0, -1.5), (1, -0.5), (2, 2.5), (3, 7.5).
- 2. Tell whether the table of values represents a linear function, an exponential function, or a quadratic function.

x	-2	-1	0	1
у	0.08	0.4	2	10

10.8 Compare Linear, Exponential, and Quadratic Models

685