

Study Guide and Intervention

Exponential Functions

EXAMPLE 1 Write a function rule

Write a rule for the function.

x	-2	-1	0	1	2
y	2	4	8	16	32

Solution

STEP 1 Tell whether the function is exponential.

	+1	+1	+1	+1	
x	-2	-1	0	1	2
y	2	4	8	16	32
	× 2	× 2	× 2	× 2	

Here, the y -values are multiplied by 2 for each increase of 1 in x , so the table represents an exponential function of the form $y = ab^x$ where $b = 2$.

STEP 2 Find the value of a by finding the value of y when $x = 0$. When $x = 0$, $y = ab^0 = a \cdot 1 = a$. The value of y when $x = 0$ is 8, so $a = 8$.

STEP 3 Write the function rule. A rule for the function is $y = 8 \cdot 2^x$.

Exercises

Write the equation for the function.

1.

x	-2	-1	0	1	2
y	3	9	27	81	243

2.

x	-2	-1	0	1	2
y	1	2	4	8	16

3.

x	-2	-1	0	1	2
y	5	25	125	625	3125

4.

x	-2	-1	0	1	2
y	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2

5.

x	-2	-1	0	1	2
y	$\frac{1}{81}$	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1

6.

x	0	1	2	3
y	2	14	98	686

7.

x	0	1	2	3
y	-50	-10	-2	-0.4

8.

x	0	1	2	3	4	5
y	2	4	8	16	32	64

9.

x	0	1	2	3	4	5
y	$\frac{1}{16}$	$\frac{1}{4}$	1	4	16	64