Unit 7, Lesson 4

Evaluating Quadratic and Exponential Functions

Let's work fluently with exponents.

4.1 Math Talk: Exponents

Evaluate mentally.

- 4^2
- 2^4
- 2^6
- 4^3

4.2 Evaluating and Describing Functions

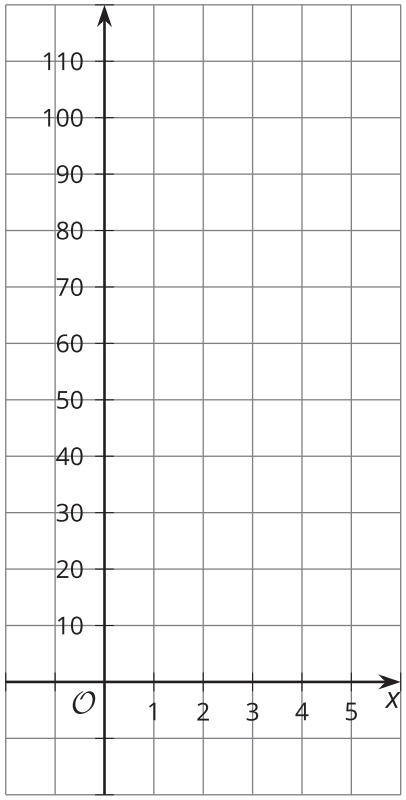
1. Different students are evaluating two expressions, $3 \cdot 6^x$ and 5^x. Analyze their work, describe the errors made, and then evaluate each expression correctly.

	Noah's work	Mai's work	corrected work
Evaluate 5^x when x is 6.	5^x 5^6 30	5^x 5^6 $6 \cdot 6 \cdot 6 \cdot 6 \cdot 6$ 7,776	
Evaluate $3 \cdot 6^x$ when x is 2.	$3 \cdot 6^x$ $3 \cdot 6^2$ $3 \cdot 12$ 36	$3 \cdot 6^x$ $3 \cdot 6^2$ 18^2 324	

2. Here are three functions. For each function:
   a. Complete the table of values.
   b. Sketch a graph.
   c. Decide whether each function is linear, quadratic, or exponential, and be prepared to explain how you know.

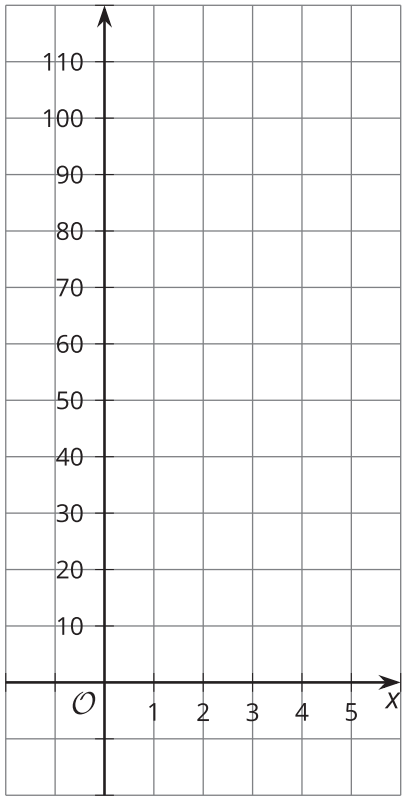
$f(x) = 3 \cdot 2^x$

x	-1	0	1	2	3	5
$f(x)$						



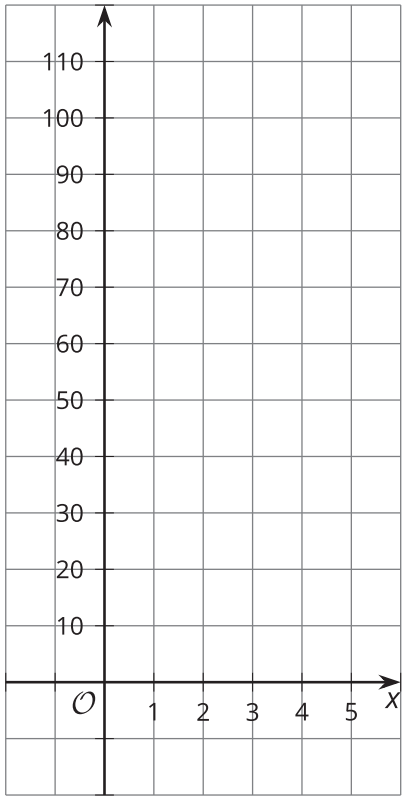
$g(x) = 3 \cdot x^2$

x	-1	0	1	2	3	5
$g(x)$						



$h(x) = 3 \cdot 2x$

x	-1	0	1	2	3	5
$h(x)$						



4.3 Row Game: Evaluating Exponential and Quadratic Expressions

For each row, you and your partner will each evaluate an expression. You should each get the same answer in each row. If you disagree, work to reach an agreement.

row	Partner A	Partner B
1	$4 \cdot 2^x$ when x is 3	$2 \cdot 2^x$ when x is 4
2	$19 + x^2$ when x is 9	$4 \cdot x^2$ when x is 5
3	$16 \cdot 2^x$ when x is 0	$2 \cdot 2^x$ when x is 3
4	$\frac{1}{2} \cdot 2^x$ when x is 4	$x^2 - 1$ when x is 3
5	$x^2 + 1$ when x is 7	$18 + 2^x$ when x is 5
6	$4 + 2^x$ when x is 4	$\frac{1}{5}x^2$ when x is 10
7	$0.1x^2$ when x is 6	$0.4x^2$ when x is 3
8	$45 \cdot x^2$ when x is $\frac{1}{3}$	$10 \cdot 2^x$ when x is -1
9	x^2 when x is -4	$64x^2$ when x is $\frac{1}{2}$
10	$-2x^2$ when x is 3	$-2x^2$ when x is -3