

## Write and Evaluate Expressions with Exponents

Study the example problem showing how to write and evaluate expressions with exponents. Then solve problems 1–9.

**Example**

Adrian wants to buy a skateboard that costs \$85. After 1 month, he has \$4 in savings and plans to quadruple the amount he has saved each month for 4 months.

Will Adrian have enough money to buy the skateboard in 4 months?

Month 1	Month 2	Month 3	Month 4
4	$4 \cdot 4 = 16$	$16 \cdot 4 = 64$	$64 \cdot 4 = 256$

Adrian will have enough money to buy the skateboard in 4 months. He will have \$171 more than he needs.

- 1 What does it mean to say that the amount of money from the previous month is quadrupled?

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- 2 Represent the problem with repeated multiplication.

Month	Amount Saved (in dollars)
1	4
2	$4 \cdot \underline{\quad} = 16$
3	_____
4	_____

- 3 Write an expression using an exponent to represent the amount of money Adrian will have saved by month 4.

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- 4 What is the value of the expression you wrote in problem 3?

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**Solve.**

**Use the following situation to solve problems 5–7.**

Five students received the same text message at 9:00 AM. Each of them sent the message to 5 more students at 10:00 AM. Each of those students sent the message to 5 more students at 11:00 AM.

- 5 Represent the situation with exponential expressions. Simplify the expressions.

Time That Message Is Received	Number of Students Receiving Text Message
9:00 AM	$5^1 = 5$
10:00 AM	
11:00 AM	

- 6 If the pattern continues, how many students will receive the text message at noon? Explain how to use the pattern to find the answer.

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- 7 If the pattern continues, at what time will 15,625 students receive the text message? Explain how you know.

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- 8 Write and simplify an expression to represent  $6^3$ .

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- 9 Chin says that the value of  $2^5$  is 10. Explain what Chin did wrong and find the correct value.

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