

Name: _____

Equivalent Expressions Using Exponents

Faisal and Sonya are looking for patterns in the following chart:

3^0	1
3^1	3
3^2	9
3^3	27
3^4	81
3^5	243

Faisal says, "Each number is 3 times greater than the one before it. For example, $3^2 = 9$, and $3^3 = 27$. And 27 is 3 times greater than 9."

Sonya says, "So you're kind of saying that $3^2 \times 3 = 3^3$. Is that right?"

Faisal says, "Yeah, I guess so. I wonder if that means $3^2 \times 3 \times 3 = 3^4$?"

1) Does $3^2 \times 3 \times 3 = 3^4$? Explain your answer in the notes box below.

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Sonya says, "If $3^2 \times 3 \times 3 = 3^4$, then that means $3^2 \times 3^2 = 3^4$. I wonder what $3^2 \times 3^3$ equals?"

2) Answer Sonya's question below. How could you figure out what $3^2 \times 3^3$ equals?

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Name: _____

3^0	1
3^{-1}	$1/3$
3^{-2}	$1/9$
3^{-3}	$1/27$
3^{-4}	$1/81$
3^{-5}	$1/243$

③ Faisal says, "I wonder if this works for negative exponents, too. If $3^2 \times 3^3 = 3^5$, does $3^{-2} \times 3^{-3} = 3^{-5}$?"

Do you agree or disagree with Faisal? Explain your ideas below.

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