Name: _____

Evaluate Expressions with Exponents

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

Example

Follow the order of operations to simplify $12 - 3^2$.

First find 3^2.

$$3^2 = 3 \cdot 3$$
$$= 9$$

Then subtract 9 from 12.

$$12 - 9 = 3$$

This means that:

$$12 - 3^2 = 12 - 9$$
$$= 3$$

The value of the expression is 3.

1 Explain why you must simplify 3^2 first.

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_____

2 Diallo says that the value of $12 - 3^2$ is 81. How did he get that answer?

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3 Maggie says that if the expression was $12 \div 3^2$, you would divide before simplifying 3^2. Is she right? Explain.

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4 Suppose the expression was $(12 - 3)^2$. Would you still simplify 3^2 first? Explain.

_____

_____

Solve.

5 What is the value of $4 + 2^3 \cdot 3$?
Show your work.

Solution: _____

6 What is the value of $\frac{4^2}{2}$? Describe the steps you took
to find your answer.

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7 Darren and Barb each tried to evaluate $6^2 + 4 \div 2$.

Darren

$6^2 + 4 \div 2$
$= 36 + 4 \div 2$
$= 40 \div 2$
$= 20$

Barb

$6^2 + 4 \div 2$
$= 36 + 4 \div 2$
$= 36 + 2$
$= 38$

Who evaluated the expression correctly? Explain what
the other student did wrong.

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8 Use the numbers 8, 6, and 2 and one operation to write
an expression that includes an exponent and has a value
of 8. Use each number only once.

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9 Show where to place parentheses in the expression
$4 + 3^2 \cdot 5 - 2$ so that the value of the expression is 31.

$4 + 3^2 \cdot 5 - 2$