LESSON MAKER PRO

Operation Quest

Use rational numbers, exponents, and radicals in the correct order.

GRADE 8 · MA.8.NSO.1.7

MA.8.NSO.1.7 "Solve multi-step mathematical and real-world problems involving the order of operations with rational numbers including exponents and radicals."

NAME _____ DATE _____

ORDER MATTERS

Work in this order: grouping symbols, exponents and radicals, multiplication and division from left to right, then addition and subtraction from left to right. A radical such as sqrt(100) is evaluated with exponents before you combine the other operations.

WORKED EXAMPLE

$(7/9 + 2/9) * \text{sqrt}(121) - 4^2$

1. 7/9 + 2/9 = 9/9 = 1.
2. sqrt(121) = 11 and $4^2 = 16$.
3. 1 * 11 - 16 = -5.

Answer: -5

PRACTICE 6 problems

1 $-10 + 3^3$

ANSWER _____

2 $(5/6 + 1/6) * 18$

ANSWER _____

3 $\text{sqrt}(64) - 12/3$

ANSWER _____

4 $125/(-5)^3 + 6$

ANSWER _____

5 $(15 - \text{sqrt}(81))/3$

ANSWER _____

6 $(13/8 + 11/8) * 14$

ANSWER _____

APPLY IT Show your work

1 A game gives Amir sqrt(144) bonus energy points. He spends 5/3 points on each of 3 power-ups, then a multiplier makes his remaining points 6 times as large. How many energy points does Amir have after the multiplier?

WORK SPACE

ANSWER _____

2 A digital art contest awards Elena 3^3 credits. She buys 6 brush packs that cost 5/6 credit each. Then she triples the credits she has left. How many credits does Elena have?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Evaluate: $[(\text{sqrt}(400) - 5^3) * 6]/11$

WORK SPACE AND ANSWER

ANSWER KEY # Operation Quest

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	$-10 + 3^3$	**17**
2	(5/6 + 1/6) * 18	**18**
3	sqrt(64) - 12/3	**4**
4	$125/(-5)^3 + 6$	**5**
5	(15 - sqrt(81))/3	**2**
6	(13/8 + 11/8) * 14	**42**

PART 2 · APPLY IT

1. **42 energy points** Evaluate sqrt(144) first. Subtract 3 * 5/3 from 12, then multiply the remaining 7 points by 6.
2. **66 credits** Evaluate 3^3, then find the total cost of the brush packs. Subtract 5 from 27, and multiply the remaining 22 credits by 3.

CHALLENGE

-630/11

Accept equivalent simplified forms, including 2 for problem 5 and -57 3/11 for the challenge. Students should evaluate radicals and exponents before multiplying, dividing, adding, or subtracting.