

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

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

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 $\sqrt{64} - 12/3$

ANSWER _____

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

ANSWER _____

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

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 $\frac{5}{3}$ 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 $\frac{5}{6}$ credit each. Then she triples the credits she has left. How many credits does Elena have?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

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

PART 1 • PRACTICE

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

PART 2 • APPLY IT

1. **42 energy points** Evaluate $\sqrt{144}$ first. Subtract $3 \cdot 5/3$ 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 $-57 \frac{3}{11}$ for the challenge. Students should evaluate radicals and exponents before multiplying, dividing, adding, or subtracting.