LESSON MAKER PRO

Expression Power Path

Simplify with grouping, powers, roots, and absolute value.

GRADE 7 · 7.PFA.2.a

7.PFA.2.a "Use the order of operations and apply the properties of real numbers to simplify numerical expressions. Exponents are limited to 1, 2, 3, or 4 and bases are limited to positive integers..."

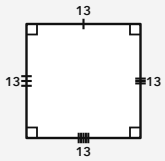
NAME _____ DATE _____

FOLLOW THE ORDER

Simplify inside grouping symbols and absolute value bars first. Then evaluate exponents and square roots, multiply or divide from left to right, and add or subtract from left to right. You can use the distributive property to break apart a product when it helps.

WORKED EXAMPLE

Use the side length shown in the square. Simplify $|\text{side length} - 17|^2 / 4$.

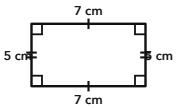


1. Substitute the side length: $|13 - 17|^2 / 4$.
2. Evaluate inside the bars: $4^2 / 4$.
3. Evaluate the exponent and divide: $16 / 4 = 4$.

Answer: 4

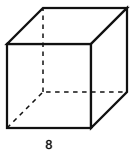
PRACTICE 6 problems

1 Use the longer side and shorter side shown in the rectangle. Simplify 3 × (longer side + shorter side) - 6.



ANSWER _____

2 Use the cube's edge length shown. Simplify √(edge length + 8) + 11.



ANSWER _____

3 Simplify $|15 - 21| + 18 / 3$.

ANSWER _____

4 Simplify $7 \times (12 - 5) + 9$.

ANSWER _____

5 Simplify $5^3 - 36 / 6$.

ANSWER _____

6 Simplify $3^3 / 9 + |12 - 19|$.

ANSWER _____

APPLY IT Show your work

1 At an esports tournament, a team earns 4^3 points from bonus rounds. A penalty of $|19 - 26|$ points is taken away. The remaining points are shared equally by 3 players. How many points does each player receive?

WORK SPACE

ANSWER _____

2 A music app gives a creator $\sqrt{81}$ bonus points for a remix challenge and 6^2 points for saved tracks. The creator splits the total equally among 3 playlists. How many points are assigned to each playlist?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify $[\sqrt{144} + (5^3 - |31 - 40|)] / 4$.

WORK SPACE AND ANSWER

ANSWER KEY

Expression Power Path

GRADE 7 · 7.PFA.2.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the longer side and shorter side shown in the rectangle. Simplify 3 × (longer side + shorter side) - 6.	**30**
2	Use the cube's edge length shown. Simplify √(edge length + 8) + 11.	**15**
3	Simplify |15 - 21| + 18 / 3.	**12**
4	Simplify 7 × (12 - 5) + 9.	**58**
5	Simplify 5^3 - 36 / 6.	**119**
6	Simplify 3^3 / 9 + |12 - 19|.	**10**

PART 2 · APPLY IT

1. **19 points** Evaluate $4^3 = 64$ and $|19 - 26| = 7$. Then $(64 - 7) / 3 = 19$.
2. **15 points** Evaluate $\sqrt{81} = 9$ and $6^2 = 36$. Then $(9 + 36) / 3 = 15$.

CHALLENGE

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Accept equivalent numerical forms, such as 19 for 19 points when the unit is clear. For the challenge, accept correct work that evaluates the square root, exponent, and absolute value before completing the grouped expression.