LESSON MAKER PRO

Substitute and Solve

Use replacement values, properties, and the order of operations.

GRADE 7 · 7.PFA.2.d

7.PFA.2.d "Use the order of operations and apply the properties of real numbers to evaluate algebraic expressions for given replacement values of the variables. Exponents are limited to 1, 2, 3, or 4 and bases are limited to positive integers..."

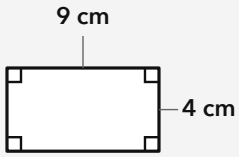
NAME _____ DATE _____

REPLACE, THEN CALCULATE

Replace x with its given value before you calculate. Then evaluate grouping symbols, exponents and square roots, multiplication and division, and finally addition and subtraction. Absolute value gives the distance from 0, so its result is never negative.

WORKED EXAMPLE

The rectangle shows two side lengths. Let x represent the longer labeled side. Evaluate $(x - 8)^4 + 5$.



1. $x = 9$
2. $(9 - 8)^4 + 5$
3. $1^4 + 5 = 1 + 5$
4. 6

Answer: 6

PRACTICE 6 problems

1 Evaluate $7 + 10x$ when $x = -2$.

ANSWER _____

2 Evaluate $11x - 12$ when $x = -3$.

ANSWER _____

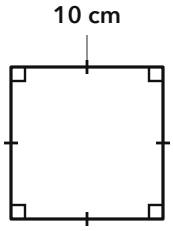
3 Evaluate $[14 - 2x] / 7$ when $x = 3/2$.

ANSWER _____

4 Evaluate $|x + 13| - 2^2$ when $x = -20$.

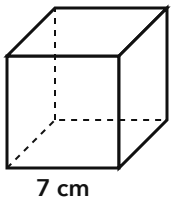
ANSWER _____

5 The square has a labeled side. Let x represent the side length shown. Evaluate $\sqrt{(x^2)} + 7$.



ANSWER _____

6 The cube has edge length 7 cm. Let x = 7 represent that edge length. Evaluate $[x^3 - 2x] / 7$.



ANSWER _____

APPLY IT Show your work

1 An esports club uses the challenge-score expression $3x^2 - 7$. Use the x value in the table to calculate the score for this round.

CHALLENGE ROUND

Round	Value of x
Final round	11

ANSWER _____

2 A music-mixing app calculates a bonus score with $|x|^3 - 2x$. For one remix, the signed streak change is $x = -10$. What is the bonus score?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Evaluate $[|3x|^2 + \sqrt{49}] / |x|$ when $x = -7/3$. Show the order in which you evaluate the expression.

WORK SPACE AND ANSWER

ANSWER KEY # Substitute and Solve

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate 7 + 10x when x = -2.	**-13**
2	Evaluate 11x - 12 when x = -3.	**-45**
3	Evaluate [14 - 2x] / 7 when x = 3/2.	**11/7**
4	Evaluate $\|x + 13\| - 2^2$ when x = -20.	**3**
5	The square has a labeled side. Let x represent the side length shown. Evaluate $\sqrt{(x^2)} + 7$.	**17**
6	The cube has edge length 7 cm. Let x = 7 represent that edge length. Evaluate $[x^3 - 2x] / 7$.	**47**

PART 2 · APPLY IT

1. **356** Substitute 11 for x. Calculate $3(11^2) - 7 = 3(121) - 7 = 356$.
2. **1020** First find $|-10|^3 = 1000$. Then subtract 2(-10), so 1000 + 20 = 1020.

CHALLENGE

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Accept equivalent forms of 11/7, including 1 4/7. Require students to substitute before applying exponents, square roots, and absolute value.