

ALGEBRA 1

UNIT 1 • LESSON 3

Evaluating Expressions & Significant Figures

Evaluating Expressions • Significant Figures

Goal: substitute accurately, evaluate expressions, and report measured values with appropriate precision.

Access IDEAS presents a customized session for Algebra 1, Unit 1, Lesson 3.



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Agenda

- Sample Math Problem
- Go over questions from Lesson#2 HW (show PDF)
- Evaluating Expressions
- Significant Figures
- Questions and Homework Help
- Extra Challenge

Sample Math Problem

What is the value of $(8 \times 4 + 2) - (8 + 4 \times 2)$?

Please post your answer in chat.

Math Problem — Solution

What is the value of $(8 \times 4 + 2) - (8 + 4 \times 2)$?

SOLUTION

$$(8 \times 4 + 2) - (8 + 4 \times 2)$$

$$(32 + 2) - (8 + 8)$$

$$34 - 16$$

$$18$$

Answer: 18

Attendance

Please post your name in Zoom Chat.
Also, let me know how many videos you watch for this week's lesson.

Example: Jack Chung, 3 videos

Lesson#2 HW

Go over questions from Lesson#2 HW ([show PDF](#))

Evaluating Expressions

Substitute given values, use grouping symbols, and follow the order of operations.

1 SUBSTITUTE

Replace each variable with its assigned value.

2 PARENTHESES

Put substituted negative values in parentheses.

3 ORDER (PEMDAS)

Apply exponents, multiply/divide, then add/subtract.

4 ACCURACY

Rewrite one line at a time and keep signs visible.

5 CHECK

Estimate or substitute again to confirm the result.

Substitute → Group → Evaluate → Check

Evaluating Expressions — Problem 1

Evaluate: $3x + 5$ when $x = 4$

Evaluating Expressions — Problem 1 Solution

Evaluate: $3x + 5$ when $x = 4$

SOLUTION

$$3x + 5$$

$$3(4) + 5$$

$$12 + 5$$

$$17$$

Substitute $x = 4$

Multiply: $3 \times 4 = 12$

Add 5

Answer: 17

Evaluating Expressions — Problem 2

Evaluate: $2a^2 - 3b$ when $a = -2$ and $b = 5$

Please post your answer in chat.

Evaluating Expressions — Problem 2 Solution

Evaluate: $2a^2 - 3b$ when $a = -2$ and $b = 5$

SOLUTION

$$2a^2 - 3b$$

$$2(-2)^2 - 3(5)$$

$$2(4) - 15$$

$$8 - 15$$

$$-7$$

*Substitute using
parentheses*

$$(-2)^2 = 4$$

*Multiply, then
subtract*

Answer: -7

Evaluating Expressions — Problem 3

Evaluate: $4m - 2n^2 + 3$ when $m = -1$ and $n = -3$

Please post your answer in chat.

Evaluating Expressions — Problem 3 Solution

Evaluate: $4m - 2n^2 + 3$ when $m = -1$ and $n = -3$

SOLUTION

$$4m - 2n^2 + 3$$

$$4(-1) - 2(-3)^2 + 3$$

$$-4 - 2(9) + 3$$

$$-4 - 18 + 3$$

$$-19$$

Substitute both values

$$(-3)^2 = 9$$

Multiply; then combine

Answer: -19

Significant Figures

Significant figures communicate the precision of a measured value.

1 NONZERO

Every nonzero digit is significant.

2 CAPTIVE ZEROS

Zeros between nonzero digits are significant.

3 LEADING ZEROS

Zeros before the first nonzero digit are not significant.

4 TRAILING ZEROS

After a decimal, trailing zeros are significant.

Significant Figures — Problem 1

How many significant figures are in 0.00450?

Please post your answer in chat.

Significant Figures — Problem 1 Solution

How many significant figures are in 0.00450?

SOLUTION

0.00450

Leading zeros do not count.

Digits 4 and 5 count.

The final zero counts.

*Start at the first
nonzero digit*

*Trailing zero after a
decimal counts*

Answer: 3 significant figures

Significant Figures — Problem 2

How many significant figures are in these numbers:

- 1234
- 709
- 0.0234
- 8400
- 8400.
- 8400.0

Significant Figures — Problem 2 Solution

How many significant figures are in these numbers: (Answer in *red*)

- 1234 (4)
- 709 (3)
- 0.0234 (3)
- 8400 (2)
- 8400. (4)
- 8400.0 (5)

Significant Figures — Problem 3

Round 38,647 to 3 significant figures.

Please post your answer in chat.

Significant Figures — Problem 3 Solution

Round 38,647 to 3 significant figures.

SOLUTION

38,647

First 3 digits: 3, 8, 6

Next digit is 4, so keep 6.

$38,600 = 3.86 \times 10^4$ (scientific notation)

Answer: 3.86×10^4 (three sig-fig)

Significant Figures — Problem 4

A rectangle is 4.56 cm by 2.1 cm. Find its area using correct significant figures.

Please post your answer in chat.

Significant Figures — Problem 4 Solution

A rectangle is 4.56 cm by 2.1 cm. Find its area using correct significant figures.

SOLUTION

$$A = lw$$

$$A = (4.56)(2.1)$$

$$A = 9.576 \text{ cm}^2$$

Fewest significant figures = 2

$$A \approx 9.6 \text{ cm}^2$$

Answer: 9.6 cm²

Significant Figures — Problem 5

A car travels 125.0 km in 9.8 h. Using $v = d/t$, find its speed with the correct number of significant figures.

Please post your answer in chat.

Significant Figures — Problem 5 Solution

A car travels 125.0 km in 9.8 h. Using $v = d/t$, find its speed with the correct number of significant figures.

SOLUTION

$$v = d/t$$

$$v = 125.0 \div 9.8$$

$$v = 12.755...$$

Fewest significant figures = 2

$$v \approx 13 \text{ km/h}$$

Use the speed formula

Substitute the measured values

Divide

Round to 2 significant figures

Answer: 13 km/h

Questions and Homework Help

- Please let me know if you have any questions on the lesson today.
- Please let me know if you have any questions on your Algebra-related homework.



THANK YOU

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