LESSON MAKER PRO

# Inside the Expression

*Find the meaning of a part before finding the value of the whole.*

**HIGH SCHOOL · A1P.AF.A.4**

**A1P.AF.A.4** "Interpret linear, quadratic, and exponential expressions in terms of a context by viewing one or more of their parts as a single entity."

NAME _____ DATE _____

## READ THE PARTS

Treat a grouped part of an expression as one quantity. Use the situation to name that quantity, then calculate the full value.

## WORKED EXAMPLE

A party for 7 guests costs 7(13+5)+9 dollars. Use the table to interpret 13+5 and find the total cost.

**PARTY COSTS**

| Item | Cost |
|---|---|
| Ticket per guest | $13 |
| Snack per guest | $5 |
| One-time fee | $9 |

1. 13+5 = 18 dollars per guest.
2. 7(18) = 126 dollars for the guests.
3. 126+9 = 135 dollars total.

**Answer: 13+5 is the cost per guest. The total is $135.**

## PRACTICE 4 problems

**1** A club pays 3(8+4) dollars for 3 shirts. Each shirt costs $8, plus $4 to print. What does 8+4 mean? Find the total.

**ANSWER** _____

**2** A square stage has side length x+6 feet and area $(x+6)^2$ square feet. What does x+6 represent? Find the area if x=4.

**ANSWER** _____

**3** A game score is $8(1+1/2)^x$ after x rounds. What does 1+1/2 mean? Find the score after 2 rounds.

**ANSWER** _____

**4** An $80 jacket is marked down by 1/4, then a $6 fee is added: 80(1-1/4)+6. What does 80(1-1/4) mean? Find the final price.

**ANSWER** _____

## APPLY IT Show your work

**1** A creator makes 4 sticker bundles. Each bundle has x+2 stickers, and each sticker costs $3 to print. The total cost is 4(3(x+2)) dollars. What does 3(x+2) represent? Find the total if x=3.

WORK SPACE

**ANSWER** _____

**2** A video earns 32 points on day 0. Its points double each day, and a 6-point bonus is added after 3 days. The score is $32(2)^3+6$. What does $32(2)^3$ represent? Find the score.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A concert ticket starts at $40. Its price rises by 1/4 each week, then an $8 fee is added at checkout. After x weeks, the cost is $40(1+1/4)^x+8$. Does the fee grow each week? Explain and find the cost after 2 weeks.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Inside the Expression

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## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | A club pays 3(8+4) dollars for 3 shirts. Each shirt costs $8, plus $4 to print. What does 8+4 mean? Find the total. | **8+4 is the cost of one printed shirt. The total is $36.** |
| 2 | A square stage has side length x+6 feet and area $(x+6)^2$ square feet. What does x+6 represent? Find the area if x=4. | **x+6 is the stage's side length. The area is 100 square feet.** |
| 3 | A game score is $8(1+1/2)^x$ after x rounds. What does 1+1/2 mean? Find the score after 2 rounds. | **1+1/2 is the multiplier each round, a 50% increase. The score is 18.** |
| 4 | An $80 jacket is marked down by 1/4, then a $6 fee is added: 80(1-1/4)+6. What does 80(1-1/4) mean? Find the final price. | **80(1-1/4) is the discounted jacket price, $60. The final price is $66.** |

## PART 2 · APPLY IT

1. **3(x+2) is the printing cost for one bundle. The total is $60.** At x=3, each bundle costs 3(3+2) = $15 to print. Four bundles cost 4(15) = $60.
2. **$32(2)^3$ is the points earned after 3 days, before the bonus. The score is 262 points.** The points before the bonus are 32(8) = 256. Adding 6 gives 262.

## CHALLENGE

**No. The $8 fee is outside the part multiplied each week, so it stays $8. After 2 weeks, the cost is $40(5/4)^2+8 = \$70.50$.**

Accept equivalent descriptions of each grouped quantity. For the challenge, the explanation must distinguish the fixed fee from the growing ticket price.