

Expression Detective

Read what each part tells you.

GRADE 8 • 8.PAR.3.1

8.PAR.3.1 "Interpret expressions and parts of an expression, in context, by utilizing formulas or expressions with multiple terms and/or factors."

NAME _____

DATE _____

READ THE PARTS

An expression can combine a per-unit amount, a fixed amount, and grouped quantities. Read what the variable means first, then use multiplication and grouping to decide what each term or factor tells you. To find a total for a given value, substitute and follow the order of operations.

WORKED EXAMPLE

A bike rental costs $C = 4h + 7$ dollars, where h is the number of rental hours. What do $4h$ and 7 mean? Find C when $h = 3$.

1. $4h$ is the hourly rental cost, \$4 for each of h hours.
2. 7 is a one-time rental fee.
3. Substitute $h = 3$: $C = 4(3) + 7$.
4. $C = 12 + 7 = 19$.

Answer: $4h$ is the hourly cost, 7 is the one-time fee, and $C = \$19$.

PRACTICE 6 problems

- 1** A music download bundle costs $6n + 10$ dollars, where n is the number of downloads. What does $6n$ represent?

ANSWER _____

- 2** A club's score is modeled by $S = 9w + 14$, where w is the number of wins. What does 14 represent?

ANSWER _____

- 3** A game gives a player $2(b + 8)$ coins, where b is the number of bonus-chest coins. What does the factor 2 tell you?

ANSWER _____

- 4** A practice score is modeled by $S = 11t - 5$, where t is the number of hours practiced. What do $11t$ and -5 represent?

ANSWER _____

- 5** A fundraiser has a \$20 donation before selling meal tickets. Its total is $F = 15m + 20$, where m is the number of tickets sold. Find F when $m = 2$.

ANSWER _____

- 6** The area of a rectangular banner is $A = 18x$ square centimeters, where x is the width in centimeters. What do 18 and x represent?

ANSWER _____

APPLY IT Show your work

- 1** An esports club orders custom jerseys. The total cost is $C = 16j + 25$ dollars, where j is the number of jerseys. The jerseys cost \$16 each, and the logo setup has a fixed fee. Explain what $16j$ and 25 mean. Then find C when $j = 5$.

WORK SPACE

ANSWER _____

- 2** A video creator saves files using $S = 8(9 + v)$ gigabytes, where 9 is the number of starter clips and v is the number of new clips. Explain what 8 and $(9 + v)$ mean. Find S when $v = 6$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An art club makes 5 identical gift packs. Each pack has s stickers that cost \$2 each and a \$9 packaging fee. The total cost is $T = 5(2s + 9)$. Explain why 5 multiplies the whole expression in parentheses. Then find T when $s = 13$.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A music download bundle costs $6n + 10$ dollars, where n is the number of downloads. What does $6n$ represent?	The cost of n downloads at \$6 each.
2	A club's score is modeled by $S = 9w + 14$, where w is the number of wins. What does 14 represent?	The club's starting score of 14 points.
3	A game gives a player $2(b + 8)$ coins, where b is the number of bonus-chest coins. What does the factor 2 tell you?	The game doubles the total of the bonus-chest coins and the 8 daily coins.
4	A practice score is modeled by $S = 11t - 5$, where t is the number of hours practiced. What do $11t$ and -5 represent?	$11t$ adds 11 points for each practice hour, and -5 subtracts 5 points.
5	A fundraiser has a \$20 donation before selling meal tickets. Its total is $F = 15m + 20$, where m is the number of tickets sold. Find F when $m = 2$.	$F = \$50$.
6	The area of a rectangular banner is $A = 18x$ square centimeters, where x is the width in centimeters. What do 18 and x represent?	18 is the banner's length in centimeters, and x is its width in centimeters.

PART 2 • APPLY IT

- 16j is the cost of j jerseys at \$16 each, and 25 is the fixed logo setup fee. C = \$105.** Substitute 5 for j : $C = 16(5) + 25 = 80 + 25 = 105$. The variable term is the jersey cost, and the constant is the setup fee.
- 8 is the storage used by each clip, and (9 + v) is the total number of clips. S = 120 gigabytes.** There are $9 + 6 = 15$ clips. Multiply by 8 gigabytes per clip: $S = 8(15) = 120$.

CHALLENGE

The 5 represents five identical gift packs, so it multiplies both the sticker cost and the packaging fee. T = \$175.

Accept equivalent wording that correctly identifies per-unit amounts, fixed amounts, totals, and grouped quantities. For calculation items, accept correct equivalent numerical work and the correct unit.