

Expression Detective

Read each expression as a story about quantities.

HIGH SCHOOL • HSA-SSE.A.1

CCSS.Math.Content.HSA-SSE.A.1 "Interpret expressions that represent a quantity in terms of its context. *"

NAME _____

DATE _____

MATCH NUMBERS TO MEANING

An expression represents a quantity in a situation. Use the operation and grouping to decide what each number, variable, term, or factor means. A product often shows repeated groups, while addition or subtraction can show a starting amount, a fee, a bonus, or a cost.

WORKED EXAMPLE

A movie theater charges \$17 per ticket and adds a one-time \$5 online fee. Write an expression for the total cost of n tickets.

1. Let n represent the number of tickets.
2. The ticket cost is $17n$ dollars.
3. Add the one-time online fee: $17n + 5$.

Answer: $17n + 5$ represents the total cost, in dollars, of n tickets and the online fee.

PRACTICE 6 problems

- 1** A streaming service charges a \$12 monthly fee plus \$4 for each movie rental. Its cost is $12 + 4m$. What does $4m$ represent?

ANSWER _____

- 2** A fundraiser earns \$9 for each bracelet sold and has a \$3 materials cost. Its net amount is $9b - 3$. What does $9b - 3$ represent?

ANSWER _____

- 3** A player begins with 48 reward points and earns 7 points in each round. Their points are $48 + 7r$. What does 48 represent?

ANSWER _____

- 4** A rectangular garden has width 6 and length $x + 8$. Its area is $6(x + 8)$. What does $x + 8$ represent?

ANSWER _____

- 5** A game pass costs \$15. The expression $15p$ models the cost of p game passes. What quantity does $15p$ represent?

ANSWER _____

- 6** A student has \$20 on a gift card and spends \$2 each day for d days. What does $20 - 2d$ represent?

ANSWER _____

APPLY IT Show your work

- 1** A student group sells T-shirts for a tournament. Each shirt sells for \$13, and the printing setup costs \$28. The group uses $13t - 28$ to model its profit after selling t shirts. Explain what $13t$, 28 , and $13t - 28$ mean. Then find the profit when $t = 4$.

WORK SPACE

ANSWER _____

- 2** A bike-share service charges a \$7 unlock fee plus \$3 for each hour h that a bike is used. The total cost is $7 + 3h$. Explain what the expression represents, then find the cost for 8 hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A gaming league gives each of 4 teams $3x$ points for completing x quests and 2 bonus points. Its total-points expression is $4(3x + 2)$. Explain why the parentheses are needed, what $3x + 2$ represents, and what $4(3x + 2)$ represents. Then find the total when $x = 7$.

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A streaming service charges a \$12 monthly fee plus \$4 for each movie rental. Its cost is $12 + 4m$. What does $4m$ represent?	$4m$ represents the cost, in dollars, of renting m movies.
2	A fundraiser earns \$9 for each bracelet sold and has a \$3 materials cost. Its net amount is $9b - 3$. What does $9b - 3$ represent?	$9b - 3$ represents the net amount of money, in dollars, after selling b bracelets and paying the materials cost.
3	A player begins with 48 reward points and earns 7 points in each round. Their points are $48 + 7r$. What does 48 represent?	48 represents the player's starting number of reward points.
4	A rectangular garden has width 6 and length $x + 8$. Its area is $6(x + 8)$. What does $x + 8$ represent?	$x + 8$ represents the length of the garden.
5	A game pass costs \$15. The expression $15p$ models the cost of p game passes. What quantity does $15p$ represent?	$15p$ represents the total cost, in dollars, of p game passes.
6	A student has \$20 on a gift card and spends \$2 each day for d days. What does $20 - 2d$ represent?	$20 - 2d$ represents the amount of money, in dollars, remaining on the gift card after d days.

PART 2 · APPLY IT

- $13t$ is the revenue, in dollars, from selling t shirts. 28 is the printing setup cost, in dollars. $13t - 28$ is the profit, in dollars. When $t = 4$, the profit is $13(4) - 28 = 24$, so the profit is \$24.** Accept equivalent descriptions of revenue, setup cost, and profit. Substitute 4 for t , then compute $52 - 28 = 24$.
- $7 + 3h$ represents the total bike-share cost, in dollars, including the unlock fee and h hours of use. For 8 hours, the cost is $7 + 3(8) = 31$, so the cost is \$31.** The 7 is the one-time unlock fee, and $3h$ is the hourly-use cost. Substitute 8 for h and add $7 + 24$.

CHALLENGE

The parentheses are needed because each team receives both the quest points and the bonus points. $3x + 2$ represents the points earned by one team. $4(3x + 2)$ represents the total points earned by all 4 teams. When $x = 7$, the total is $4(3(7) + 2) = 4(23) = 92$ points.

Accept equivalent wording that correctly identifies the quantities and units. For the challenge, students should indicate that the factor 4 applies to the entire per-team total, including the bonus points.