

Equation Quest

Use equal groups to find unknown amounts.

GRADE 3 • 3.PAR.3.7

3.PAR.3.7 "Use multiplication and division to solve problems involving whole numbers to 100. Represent these problems using equations with a letter standing for the unknown quantity. Justify solutions."

NAME _____

DATE _____

FIND THE UNKNOWN

Use multiplication when equal groups are put together. Use division when a total is shared into equal groups. Write an equation with a letter for the amount you do not know, then check that the equation is true.

WORKED EXAMPLE

A gardener plants 4 rows of 6 tulips.
How many tulips are planted?

1. Let t stand for the total number of tulips.
2. Write the equation: $4 \times 6 = t$.
3. Multiply: $4 \times 6 = 24$.
4. Check: 24 tulips make 4 equal rows of 6.

Answer: $t = 24$

PRACTICE 6 problems

- 1** A puzzle has 27 pieces put into 3 equal piles. Let n stand for the number of pieces in each pile. Write an equation, solve, and check.

ANSWER _____

- 2** An arcade game gives 8 tickets for each win. You have 64 tickets. Let n stand for the number of wins. Write an equation, solve, and check.

ANSWER _____

- 3** A game gives 11 points for each level completed. A player earns 88 points. Let n stand for the number of levels. Write an equation, solve, and check.

ANSWER _____

- 4** A teacher shares 96 cards equally among 12 players. Let n stand for the number of cards each player gets. Write an equation, solve, and check.

ANSWER _____

- 5** A craft club puts 63 beads on 9 equal strings. Let n stand for the number of beads on each string. Write an equation, solve, and check.

ANSWER _____

- 6** A player earns 35 points in 5 equal rounds. Let n stand for the points earned each round. Write an equation, solve, and check.

ANSWER _____

APPLY IT Show your work

- 1** At school game day, 72 players form equal teams of 9 players. Let t stand for the number of teams. Write an equation, solve, and write a sentence that explains why your answer is correct.

WORK SPACE

ANSWER _____

- 2** Jada opens 7 sticker packs. Each pack has the same number of stickers, and she has 84 stickers altogether. Let s stand for the number of stickers in each pack. Write an equation, solve, and write a sentence that explains why your answer is correct.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A bracelet maker has 84 beads. Each bracelet needs 7 beads. After making as many bracelets as possible, she gives 3 bracelets to friends. How many bracelets does she have left? Let b stand for the number of bracelets made. Write an equation, solve, and explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A puzzle has 27 pieces put into 3 equal piles. Let n stand for the number of pieces in each pile. Write an equation, solve, and check.	$3 \times n = 27$; $n = 9$. Check: $3 \times 9 = 27$.
2	An arcade game gives 8 tickets for each win. You have 64 tickets. Let n stand for the number of wins. Write an equation, solve, and check.	$8 \times n = 64$; $n = 8$. Check: $8 \times 8 = 64$.
3	A game gives 11 points for each level completed. A player earns 88 points. Let n stand for the number of levels. Write an equation, solve, and check.	$11 \times n = 88$; $n = 8$. Check: $11 \times 8 = 88$.
4	A teacher shares 96 cards equally among 12 players. Let n stand for the number of cards each player gets. Write an equation, solve, and check.	$12 \times n = 96$; $n = 8$. Check: $12 \times 8 = 96$.
5	A craft club puts 63 beads on 9 equal strings. Let n stand for the number of beads on each string. Write an equation, solve, and check.	$9 \times n = 63$; $n = 7$. Check: $9 \times 7 = 63$.
6	A player earns 35 points in 5 equal rounds. Let n stand for the points earned each round. Write an equation, solve, and check.	$5 \times n = 35$; $n = 7$. Check: $5 \times 7 = 35$.

PART 2 • APPLY IT

- $9 \times t = 72$; $t = 8$. Explanation: $9 \times 8 = 72$, so 8 teams use all 72 players.** Use $9 \times t = 72$ because each team has 9 players. Divide 72 by 9 to find 8 teams, then check with multiplication.
- $7 \times s = 84$; $s = 12$. Explanation: $7 \times 12 = 84$, so each pack has 12 stickers.** Use $7 \times s = 84$ because there are 7 equal packs. Divide 84 by 7 to find 12 stickers per pack, then check with multiplication.

CHALLENGE

$7 \times b = 84$; $b = 12$. Then $12 - 3 = 9$. She has 9 bracelets left because $7 \times 12 = 84$, and she gave away 3 of the 12 bracelets.

Accept equivalent equations with the factors or sides reversed, such as $27 = 3 \times n$, and equivalent division equations. Students should use a letter for the unknown and give a correct multiplication check or explanation.