

Math Model Mission

Turn real situations into equations and ratios.

GRADE 7 • 7.MP.4

7.MP.4 "Model with mathematics."

NAME _____

DATE _____

PART 1: PRACTICE

Use x for the unknown amount. Decide what changes and what stays fixed, write an equation or ratio, solve it, then substitute your answer to check that it fits the situation.

WORKED EXAMPLE

A streaming plan has an \$8 monthly fee and costs \$4 per movie. The total bill is \$32. How many movies were watched?

1. Let x = movies. $8 + 4x = 32$.
2. Subtract 8: $4x = 24$.
3. Divide by 4: $x = 6$.
4. Check: $8 + 4(6) = 32$.

Answer: 6 movies

PRACTICE 5 problems

- 1** A school store sells notebooks for \$3 each. Jay spends \$15. Model, solve, and check. How many notebooks does Jay buy?

ANSWER _____

- 2** A fundraiser pays \$9 for shipping plus \$2 per wristband. The total cost is \$19. Model, solve, and check. How many wristbands are ordered?

ANSWER _____

- 3** A printer charges \$0.25 per page. Lena has \$2.75 to spend. Model, solve, and check. How many pages can she print?

ANSWER _____

- 4** On a trail map, 3 cm represents 12 km. A route measures 15 cm on the map. Model, solve, and check. What is the actual distance?

ANSWER _____

- 5** A recipe uses $\frac{2}{3}$ cup of oats per batch. You have $\frac{10}{3}$ cups of oats. Model, solve, and check. How many batches can you make?

ANSWER _____

APPLY IT Show your work

- 1** An esports club pays a \$10 room fee plus \$3 per player for a tournament. The total cost is \$31. How many players are there? Write an equation, solve it, and check.

WORK SPACE

ANSWER _____

- 2** A club orders team shirts. A printer charges a \$12 setup fee plus \$5 per shirt, and the club has \$37. How many shirts can it order if it spends all its money?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Two music plans have different costs. Plan A charges a \$5 fee plus \$2 per song. Plan B charges a \$14 fee plus \$1 per song. Model both plans. At how many songs do the plans cost the same? Explain which plan costs less for fewer songs and which costs less for more songs.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A school store sells notebooks for \$3 each. Jay spends \$15. Model, solve, and check. How many notebooks does Jay buy?	$3x = 15$; $x = 5$ notebooks. Check: $3(5) = 15$.
2	A fundraiser pays \$9 for shipping plus \$2 per wristband. The total cost is \$19. Model, solve, and check. How many wristbands are ordered?	$9 + 2x = 19$; $x = 5$ wristbands. Check: $9 + 2(5) = 19$.
3	A printer charges \$0.25 per page. Lena has \$2.75 to spend. Model, solve, and check. How many pages can she print?	$0.25x = 2.75$; $x = 11$ pages. Check: $0.25(11) = 2.75$.
4	On a trail map, 3 cm represents 12 km. A route measures 15 cm on the map. Model, solve, and check. What is the actual distance?	$3/12 = 15/x$; $x = 60$ km. Check: 15 cm is 5 times 3 cm, and 60 km is 5 times 12 km.
5	A recipe uses $2/3$ cup of oats per batch. You have $10/3$ cups of oats. Model, solve, and check. How many batches can you make?	$(2/3)x = 10/3$; $x = 5$ batches. Check: $(2/3)(5) = 10/3$.

PART 2 • APPLY IT

- $10 + 3x = 31$; $x = 7$ players. Check: $10 + 3(7) = 31$. Use x for players. Subtract the room fee, then divide the remaining cost by the cost per player.
- $12 + 5x = 37$; $x = 5$ shirts. Check: $12 + 5(5) = 37$. Use x for shirts and include both the fixed setup fee and the cost per shirt. Solve by subtracting 12, then dividing by 5.

CHALLENGE

Plan A: $5 + 2x$. Plan B: $14 + x$. Set them equal: $5 + 2x = 14 + x$, so $x = 9$ songs. Both plans cost \$23. Plan A costs less for fewer than 9 songs, and Plan B costs less for more than 9 songs because Plan A adds more per song.

Accept equivalent equations, proportions, and correctly checked solutions. For the challenge, accept any clear explanation that identifies the equal cost at 9 songs and compares the per-song costs correctly.