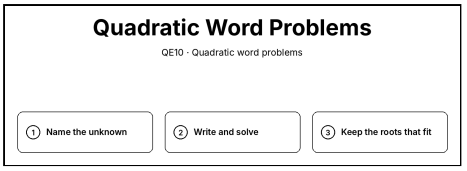
Quadratic Word Problems: teacher script

QE10-V1 · QE10 Quadratic word problems · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 114 seconds as a video.

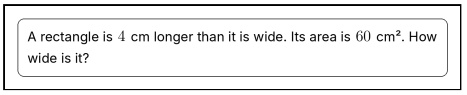
01



Say. Word problems. Name the unknown and write the equation. Solve it. Then keep the roots that fit the story, and answer the question asked.

Draw. Write the title “Quadratic Word Problems” and the steps: 1. Name the unknown; 2. Write and solve; 3. Keep the roots that fit.

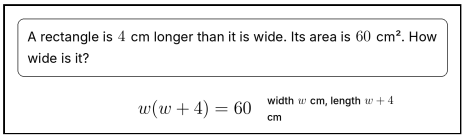
02



Say. A rectangle is 4 centimetres longer than it is wide, and its area is 60 square centimetres. How wide is it?

Draw. Clear the board. Write “A rectangle is 4 cm longer than it is wide. Its area is 60 cm². How wide is it?” in a box at the top.

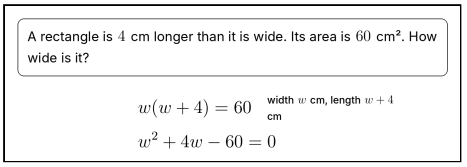
03



Say. Let the width be w centimetres. The length is w plus 4, and width times length is 60.

Draw. Write w(w + 4) = 60 on the next line. Beside it, write “width w cm, length w + 4 cm”.

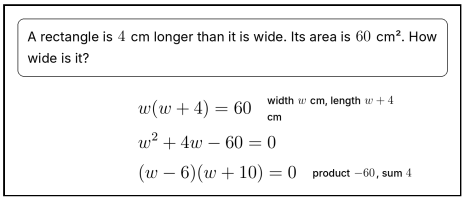
04



Say. Expand, and get 0 on one side.

Draw. Write w² + 4w − 60 = 0 on the next line.

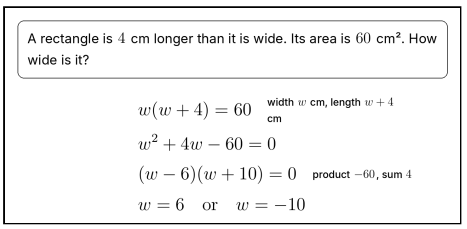
05



Say. Product negative 60, sum 4: negative 6 and 10.

Draw. Write (w − 6)(w + 10) = 0 on the next line. Beside it, write “product −60, sum 4”.

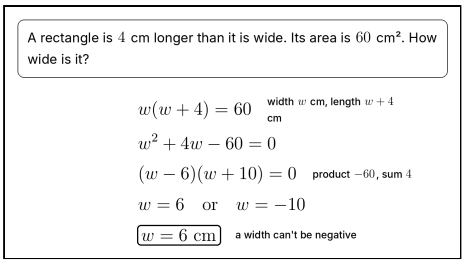
06



Say. So w equals 6 or w equals negative 10.

Draw. Write w = 6 or w = −10 on the next line.

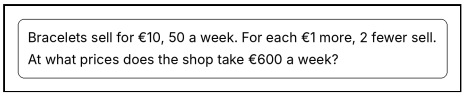
07



Say. A width can't be negative, so the rectangle is 6 centimetres wide, and 10 long. Check: 6 times 10 is 60.

Draw. Write w = 6\ cm and box it on the next line. Beside it, write “a width can't be negative”.

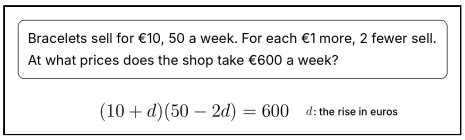
08



Say. Bracelets sell for 10 euros, and the shop sells 50 a week. For each euro more, 2 fewer sell. At what prices does the shop take 600 euros a week?

Draw. Clear the board. Write “Bracelets sell for €10, 50 a week. For each €1 more, 2 fewer sell. At what prices does the shop take €600 a week?” in a box at the top.

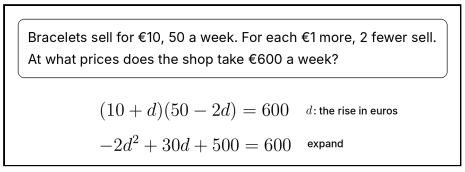
09



Say. Let the price rise by d euros. The price is 10 plus d, the number sold is 50 minus 2 d, and price times number is 600.

Draw. Write (10 + d)(50 − 2d) = 600 on the next line. Beside it, write “d: the rise in euros”.

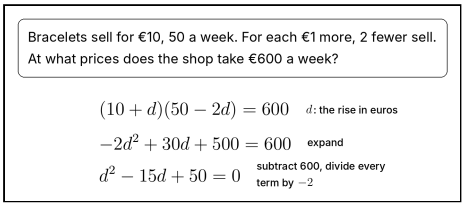
10



Say. Expand: negative 2 d squared, plus 30 d, plus 500.

Draw. Write −2d² + 30d + 500 = 600 on the next line. Beside it, write “expand”.

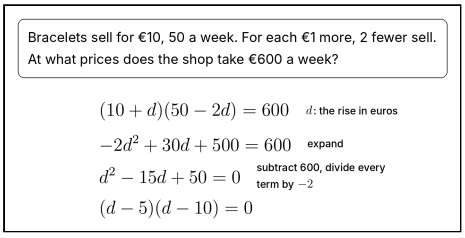
11



Say. Subtract 600, then divide every term by negative 2.

Draw. Write d² − 15d + 50 = 0 on the next line. Beside it, write “subtract 600, divide every term by −2”.

12



Say. That factors, so d equals 5 or 10.

Draw. Write (d − 5)(d − 10) = 0 on the next line.

13

Bracelets sell for €10, 50 a week. For each €1 more, 2 fewer sell. At what prices does the shop take €600 a week?

$(10+d)(50-2d)=600$ d: the rise in euros

$-2d^2+30d+500=600$ expand

$d^2-15d+50=0$ subtract 600, divide every term by -2

$(d-5)(d-10)=0$

$\boxed{15 \text{ or } 20 \text{ euros}}$ the price is $10+d$

Say. But the question asks for the price, which is 10 plus d: 15 euros or 20 euros. Both fit: 15 times 40 is 600, and 20 times 30 is 600.

Draw. Write 15 or 20 euros and box it on the next line. Beside it, write “the price is 10 + d”.

14

Trap the price

$\times$ 5 or 10

✓ 15 or 20 euros

Say. Watch for the trap: 5 and 10 are the rises, not the prices. Answer the question asked: add the rise to 10 euros.

Draw. Clear the board. Write “Trap” and the price. Below, write 5 or 10 and cross it out ×. Then write 15 or 20 euros with a tick ✓.

15

Trap $w=6$ or $w=-10$

$\times$ $w=-10$ cm

✓ $w=6$ cm

Say. Another trap: there is no negative width. Keep only the root that fits the story.

Draw. Clear the board. Write “Trap” and w = 6 or w = −10. Below, write w = −10\ cm and cross it out ×. Then write w = 6\ cm with a tick ✓.

16

Your turn

Name the unknown; keep the roots that fit.
Answer the question asked.

Say. Now it is your turn. Name the unknown, keep the roots that fit, and answer the question asked.

Draw. Point to today’s activity: Name the unknown; keep the roots that fit. Answer the question asked.