Names (group) _____ Date _____

Modelling: Maximum and Minimum

1. Situation → 2. Model (formula) → 3. Calculation → 4. Interpretation → 5. Check

Example: the fence from the first lesson

Model: $A(x) = x(10 - x) = -x^2 + 10x$. Vertex: $p = -\frac{10}{2 \cdot (-1)} = 5, q = A(5) = 25$.

Interpretation: the largest area is 25 m² when the garden is a 5×5 m square. Only $0 < x < 10$ makes sense.

1 IN A GROUP **A fence along a wall.** We have 24 m of fencing. The garden is along a wall, so the fence goes on three sides only. Which dimensions give the largest area? Go through all five steps.

1. Situation:

2. Model (formula):

3. Calculation:

4. Interpretation:

5. Check:

Names (pair) _____ Date _____

2 IN PAIRS **Revenue.** A cinema sells tickets for 10 € and has 200 viewers. Every 1 € increase in price loses 10 viewers. Which price gives the largest revenue?

Revenue after x increases: $R(x) = (10 + x)(200 - 10x) =$ ☐

Vertex: $x =$ ☐ Price: ☐ € Revenue: ☐ €

3 ON YOUR OWN **The largest product.** Two numbers add up to 20. What is the largest possible product?

$u(x) = x(20 - x) \Rightarrow$ ☐

4 ON YOUR OWN **The smallest value.** Two numbers add up to 8. For which numbers is the sum of their squares smallest?

$z(x) = x^2 + (8 - x)^2 =$ ☐

★ ON YOUR OWN **Exit card.** For which x does $f(x) = -2x^2 + 12x$ have its largest value, and what is it? $x =$ ☐ $f =$ ☐