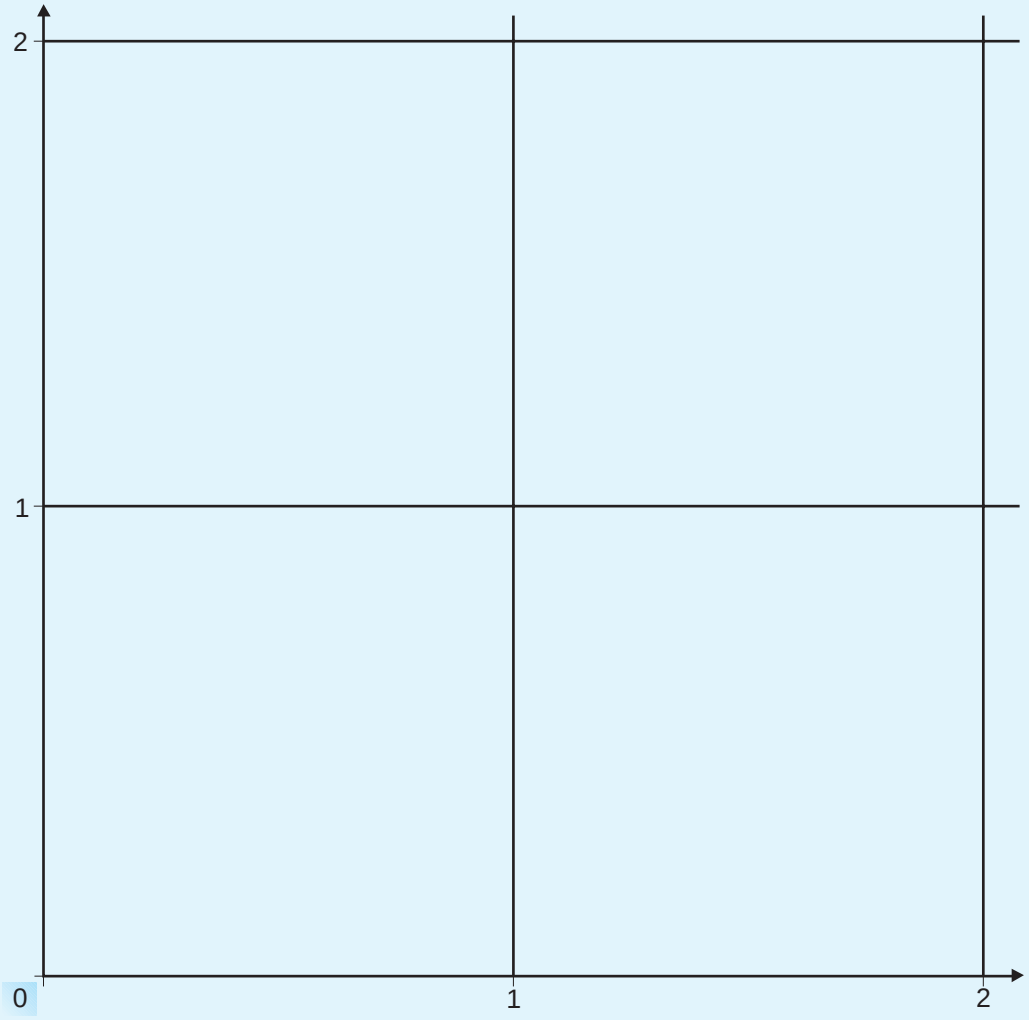
34. Multiplication of fractions

1 a. Mark a unit area in the following system (color its boundaries).

b. Using a fraction ruler, draw a rectangle of length $\frac{3}{5}$ and width $\frac{1}{2}$, and shade it. Draw it at the origin of the coordinate system.



c. Add horizontal and vertical lines,
and find the area of the shaded rectangle : _____

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2 How do we find the solution of the following multiplication exercise?

$$\frac{2}{3} \times \frac{4}{5} =$$

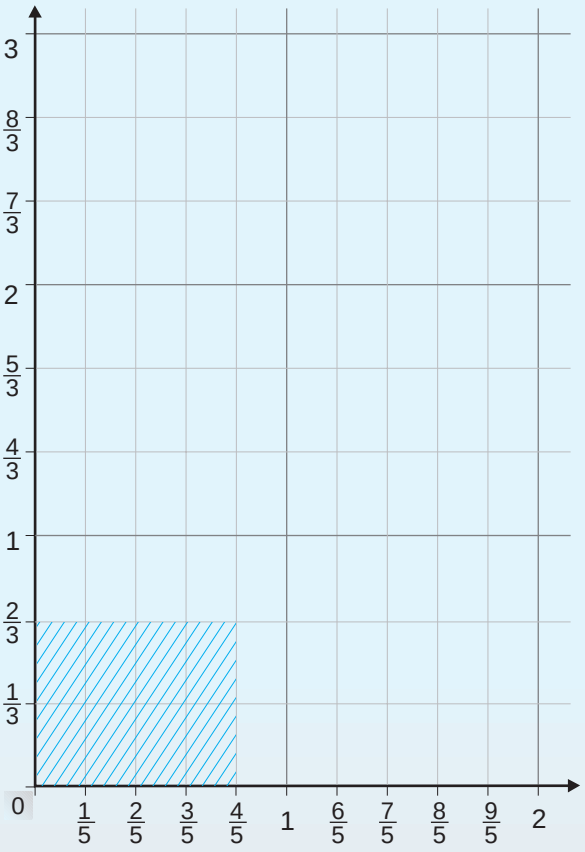
We have to build a rectangle corresponding to the exercise and find the rectangle's area in the drawing.

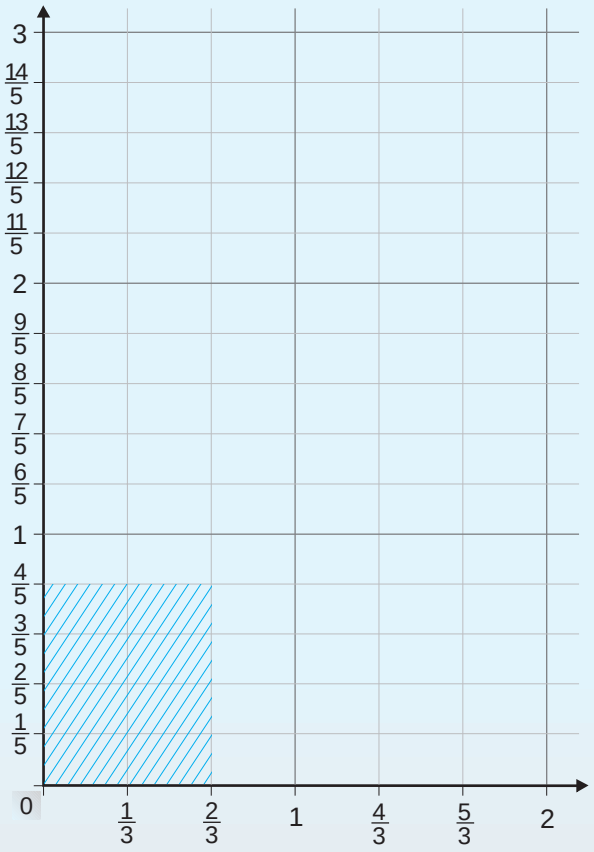
! The area of the rectangle is the solution of the multiplication exercise.

a. Take a transparent system appropriate for the exersice.
Build the rectangle corresponding to the exercise by shading or by covering it with the red transparency.

b. How many equal parts are there in a unit area in your coordinate system?
Find the area of the rectangle in the drawing: _____ _____
Write the multiplication exercise and its solution: _____

Check: Did you get a rectangle similar to one of the following rectangles?





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3 a. Solve the following multiplication exercise using a coordinate system: $\frac{2}{5} \times \frac{3}{8} =$

b. Explain: How do you see the **denominator** of the solution in the **drawing**?

How do you see the **numerator** of the solution in the **drawing**?

Discussion

When we look at the coordinate system in which we solved a fraction multiplication exercise:

- What does the product **denominator x denominator** describe?
- What does the product **numerator x numerator** describe?

c. Finish solving the exercise: $\frac{2}{5} \times \frac{3}{8} =$

Check: You may check the solution in a coordinate system.

Summary

When multiplying fractions, we multiply numerator by numerator and denominator by denominator:

The number of equal parts in a unit area = denominator × denominator

The number of equal shaded parts in the rectangle = numerator × numerator