

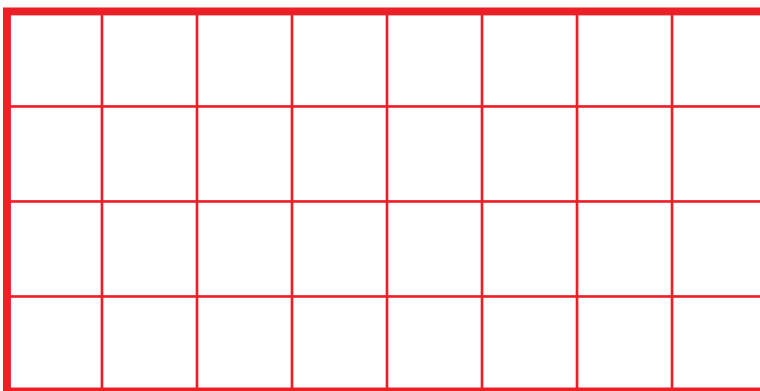
# Chef Euclid

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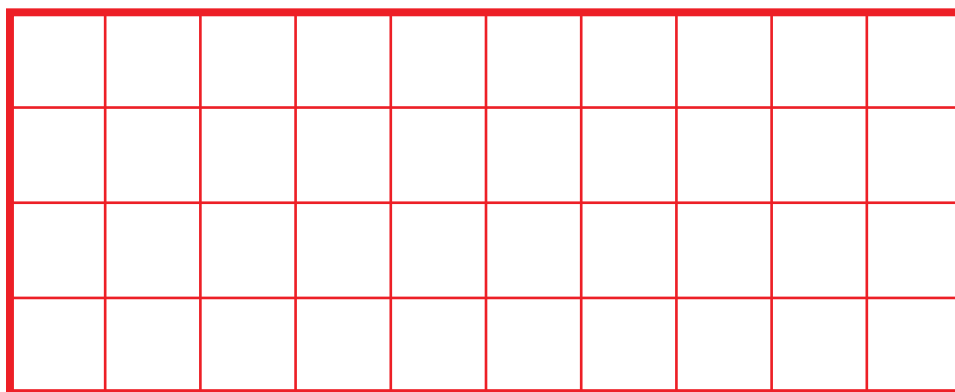


Chef Euclid bakes rectangular cakes, but he has only square baking pans. He always uses as few baking pans as possible to bake his cakes, and he never cuts a piece to make it fit.\*

1. Chef Euclid wants to bake a cake that is a  $4in \times 8in$  rectangle. Draw the baking pans he uses. What size, and how many, baking pans does he use?



2. What is the greatest number that divides both 4 and 8 evenly?
3. Next Chef Euclid wants to bake a cake that is a  $4in \times 10in$  rectangle. Draw the baking pans he uses. What size, and how many, baking pans does he use?



4. What is the greatest number that divides both 4 and 10 evenly?

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\* See J. Pommersheim, T. Marks and E. Flapan, *Number Theory: A Lively Introduction with Proofs, Applications, and Stories* (John Wiley & Sons, Inc. 2010).



5. Now Chef Euclid wants to bake a big cake that is a  $18in \times 66in$  rectangle. Draw the baking pans he uses. What size, and how many, baking pans does he use?



6. What is the greatest number that divides both 18 and 66 evenly?
7. What is the remainder when you divide 252 by 105?
8. What is the remainder when you divide 105 by your answer to problem 7?
9. What is the remainder when you divide your answer to problem 7 by your answer to problem 8?
10. Finally Chef Euclid wants to bake a really big cake that is a  $105in \times 252in$  rectangle. Draw the baking pans he uses. What size, and how many, baking pans does he use?



11. What is the greatest number that divides both 105 and 252 evenly?

