Division: A Range of Strategies for Solving 864 ÷ 32

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Let's take a look at some different strategies that could be used to solve 864 divided by 32. So the first one we're going to look at is to think multiplication. And to do that, we're going to visualize or think about a rectangle that has an edge length of 32. That's one of the factors. And we're looking for the other factor of this rectangle. We know that the area of this rectangle is this 864. So our question is, what is this edge length or the factor that if I multiply it times 32, I would get 864? So I might start that by thinking about fitting in, hmm, maybe I try 10 columns of 32, and that would be 320. And I'm thinking, okay, maybe I could fit another 10 groups of 32 in there. And that would be 320. So at this point, I have an area of 640. I'm getting closer to my 864, but I can't quite fit another 320 in there. But I bet I could fit five groups of 32 in there. And that would be half of 320. So I could use that to know this is 160, and 160 plus 640 would be 800. And that's great, because now I just have 64 left, and I might recognize that 64 is two columns of 32 and it's 864. So, I can add up these edge lengths and figure out that 864 divided by 32 is 27.

I could also approach that symbolically, thinking about how many groups of 32 I can fit into this 864. I might record that by first thinking about 10 groups of 32. So that's 320. I'm going to subtract here. Think about how many groups of 32 I can fit into that. I might try another 10 groups. And that would be 320 again. And I might think about, hmm, I can't fit another 320. Maybe I try five groups. 5 times 32 I can figure out that's 160. Subtract that and here I might recognize that I can fit two more groups of 32 in there, that'd be 64. Subtract I have zero remainder. These add up, and so 864 divided by 32 equals 27.

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Now another way we might approach 864 divided by 32 is to actually think about its division to fractions, seeing the connection between division and fractions. And the power of this, if I start thinking about this, I can start thinking about using equivalent fractions, to turn this into an easier problem to solve. So, I might look at this and think about how both of these numbers are even. And if both of these numbers are even, I can divide out a two from the top and bottom. And I have an equivalent fraction. Now think about what that means in context. I might think about, hey, if I have 864 cookies and I'm serving 32 people, each person would get the same share as if that were half as many cookies and half as many people. So that relationship is the same. And they're even again, so I could again have half as many cookies and half as many people, and each person's share would be the same. So if I do that, I'm thinking about having eight people, and up here I'm thinking about having 216 cookies. Well, I could again half that. I could have half as many people, and half as many cookies and I'd still have the same number of cookies per person. I can keep going. I could have half as many people, and half as many cookies and it's the same number of cookies per person. And now I can take that one step further and think about each person's share would be 27.

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