

Student: Gavin

Date: August 16th, 2017

094 (part 1 of 2) 10.0 points The formula for lateral surface area of a frustrum of a right circular cone is $S = \pi s(R+r)$. a) Solve for R. **1.** None of these **2.** $R = \frac{S - \pi sr}{\pi s}$ **3.** $R = S - \pi sr$ **4.** R = S - r**5.** $R = \frac{S}{\pi s}$

Aug 16th 6:30:10 pm

Hi Gavin! Welcome to Yup! *Greets student by name, welcomes them to Yup Aug 16th 6:30:49 pm

> How are we doing this evening? *Builds rapport with warm greeting Aug 16th 6:30:59 pm

I'm good just stuck

Aug 16th 6:31:04 pm

Okay no worries. Where are you stuck? *1.1 - Determine where the student is stuck Aug 16th 6:31:22 pm

I don't remember what to do

Aug 16th 6:31:36 pm

So let's start at square one.

Aug 16th 6:32:42 pm

Ok

Aug 16th 6:32:49 pm

Do you remember how you have started solving for variables in the past? *1.1 - Determines what the student knows

Aug 16th 6:33:13 pm

Not rlly no

Aug 16th 6:33:30 pm

Okay so I'll run an idea by you, and you tell me what you think.

Aug 16th 6:33:49 pm

Ok

Aug 16th 6:34:01 pm

The general process of solving for R is by trying to isolate it. We do this by "moving" the other variables to the other side.

*3.1 - Pushes information based on apparent gap Aug 16th 6:34:21 pm

Does that sound kind of familiar?

*1.1 - Determines existing knowledge Aug 16th 6:34:26 pm

Yeah

Aug 16th 6:34:30 pm

Awesome. Now, do you remember order of operations? *1.1 - Determines existing knowledge Aug 16th 6:35:11 pm

Pemdas?

Aug 16th 6:35:24 pm

Exactly. So we want to want to pay attention to that. When we look at pi*s*(R + r), we can't separate the variables in the parenthesis yet because that is the most "powerful" of the order of operations. *3.1 - Builds up student's knowledge gap

Aug 16th 6:37:53 pm

Let's first focus on the pi*s and try to get those terms to the other side.

Aug 16th 6:38:18 pm

Can't we divide the pi and a

Aug 16th 6:38:48 pm

S

Aug 16th 6:38:50 pm

Yes we can! And by doing that, what are we left with?

*1.2 - Guiding question Aug 16th 6:39:11 pm

(part 1 of 2) 10.0 points for lateral surface area of a frusor lateral surface area of a frus-circular cone is $S = \pi s(R+r)$. $\overline{T_5} = R+C$ ese

Aug 16th 6:39:36 pm

Perfect! Now we are just one step away from isolating R. Can you think of our next step? *1.2 - Invites student input Aug 16th 6:40:24 pm

Subtract the r

Aug 16th 6:40:36 pm





Aug 16th 6:41:39 pm

Okay, not quite. When we subtract r from S/pi*s, we cannot just put it in the numerator. What should we do instead? *3.1/2.1 - Redirects student's mistake with guiding question Aug 16th 6:43:06 pm

Put it in both?

Aug 16th 6:43:20 pm

Or put it in the outside

Aug 16th 6:44:02 pm

Yes put it in the outside!

Aug 16th 6:44:19 pm

That is how we have to subtract fractions.

Aug 16th 6:44:30 pm

Could you show me what that gives us? *1.2 - Invite student to try the next step Aug 16th 6:45:05 pm



Aug 16th 6:45:14 pm

*3.3 - Encouraging language Aug 16th 6:45:24 pm

So it would be 1? Aug 16th 6:45:48 pm

So now we have to do a little algebra.

Aug 16th 6:46:30 pm

Do you remember much about subtracting fractions? *1.2 - Invite student to share existing knowledge Aug 16th 6:47:34 pm

No

Aug 16th 6:47:53 pm

Okay no worries. The first step involves finding a common denominator. Does that part sound familiar? *3.1 - Adapts explanation to student's knowledge gap Aug 16th 6:48:32 pm

I've never subtracted a fraction that had no value

Aug 16th 6:49:11 pm

So when subtracting or adding fractions, they have to have the same denominator *3.1 - Adapts explanation to student's knowledge gap Aug 16th 6:51:07 pm



In our case, pi*s is the first denominator, and 1 is the second denominator. Can you see this?

Aug 16th 6:51:28 pm

Yea

Aug 16th 6:51:42 pm

So, look at the second denominator. How can we get that denominator to also equal pi*s? *1.2 - Guiding question Aug 16th 6:52:35 pm

How?

Aug 16th 6:53:06 pm

What if we multiplied pi*s to 1? Wouldn't that change the denominator to pi*s? *1.2 - Guiding question Aug 16th 6:53:59 pm

I guess

Aug 16th 6:54:32 pm

Okay good. Now, the last thing we need to worry about is that you can't just multiply the denominator of a fraction while ignoring the numerator.

Aug 16th 6:56:07 pm

If we do something to the denominator, we also have to do it to the numerator.

Aug 16th 6:56:20 pm

So, if we multiply pi*s to the denominator, what do we also have to do to the numerator? *1.2 - Guiding question Aug 16th 6:56:41 pm

Multiply

Aug 16th 6:56:55 pm

Good! And what do we multiply it by? *1.2 - Guiding question Aug 16th 6:57:12 pm

S and -r

Aug 16th 6:57:41 pm

Not quite. We multiplied the denominator by pi*s and we have to do the exact same thing to the numerator. I see what you were thinking though *3.1 - Adapt explanation to student's confusion / 3.3 - Acknowledge error without causing stress Aug 16th 6:58:57 pm

Ok

Aug 16th 6:59:18 pm

So instead, what are we going to multiply the numerator by? *1.2 - Invite student input Aug 16th 6:59:44 pm



Aug 16th 6:59:58 pm

Bingo! *3.3 - Positive language Aug 16th 7:00:16 pm

That is correct!

Aug 16th 7:00:22 pm

So this was definitely a tricky problem. Do you have any other questions about it? *3.1 - Check for understanding Aug 16th 7:01:05 pm

No not really

Aug 16th 7:01:15 pm

Thank u!

Aug 16th 7:01:30 pm

No problem! Did you have any other questions you wanted to work? *Make sure student doesn't need more help Aug 16th 7:01:50 pm