

Compound Measures

KS3 Maths

Harriet	Oh Sophie. This homework is way too tricky.
Sophie	It's OK Harriet, I know someone who can help. He's a real genius.
Sophie & Harriet	(Gasps)
Mathsmutt	Hello, I'm Mathsbutt, how do you do?
Sophie	Erm... Is Mathsmutt there? We need help with Harriet's homework.
Mathsmutt	Hit me!
Harriet	I'm so confused, how do you calculate two completely different things like the amount of water in a swimming pool and the time it takes to drain?
Mathsmutt	With compound measures Harriet! Ok let's take a look at that question.
Harriet	If a swimming pool drains at a rate of $2.5\text{m}^3/\text{min}$ and takes 5 hours 20 minutes to empty, what volume of water was in the pool originally?
Mathsmutt	<p>Hmmm. Let's break it down!</p> <p>A m^3 means a volume 1m by 1m by 1m.</p> <p>A rate of 2.5m^3 per minute means 2.5m^3 in every one minute.</p> <p>That's what per means. I remember it like this... A cat purrs once in every breath. Per means in one. OK enough with the cat.</p> <p>Now our pool takes 5 hours 20 minutes to empty, right? So how many minutes is that?</p>
Sophie	Well, there's 60 minutes in an hour. So 5 of those is 300 minutes.
Harriet	Plus the extra 20 equals 320 minutes.

Bitesize

- Mathsmutt** The pool drains at the rate of 2.5m^3 per minute. So now we can work out how much water was in the pool originally by calculating 320 lots of 2.5m^3 ...
- Harriet** Which is 800 metres cubed!
- Mathsmutt** Correctamundo!
- Sophie** Ok. If the pool is then refilled with water at the rate of 4m^3 per minute, how long will it take to fill up again?
- Mathsmutt** Wait. Remember the cat!
- Harriet** Yes, per means in one. So that's 4m^3 in every one minute.
- Mathsmutt** Bingo! Now if the volume of the pool is 800m^3 , working out how many lots of 4m^3 there are in 800m^3 will give us the time it takes to fill up.
- Sophie** So really it's just 800 divided by 4.
- That's 200 minutes!
- Harriet** Which is 3 whole hours plus 20 minutes.
- Mathsmutt** So girls, have you had your 'fill' of compound measures now?
- Harriet** Yes, thanks Mathsmutt, and after all those swimming pool calculations, we're feeling pretty 'drained'.
- Mathsmutt** Now if you'd excuse me, I'm a little behind.
- Sophie** Bye Mathsmutt
- (laughter)