Are these expressions equivalent?

Annotation

Geoff is able to use algebraic notation to write a rule to express the information given. He shows an understanding of the order of operations that allows him to use his rule to calculate a value.

Problem: Are these expressions equivalent?

The teacher poses the following task:

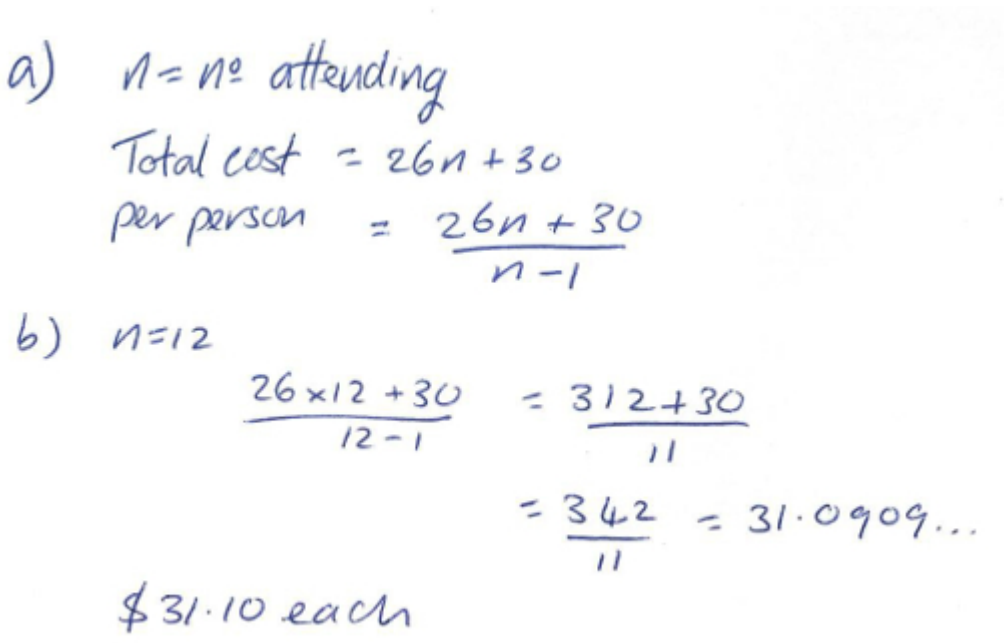
Sally is organising a surprise birthday meal for a friend at her favourite café. She has been quoted a price of $26 per person for the meal, with an additional $30 for the fancy cake.

Sally will get everyone attending, except the birthday girl, to pay an equal share of the full cost.

a) Write a rule that will allow Sally to work out how much each person should pay if n people attend.

b) User your rule to find the cost per person if 12 people attend, including the birthday girl.

Student Response



Teacher: Your rule is in the form of a fraction. Tell me about this.

Geoff: So, to work out how much each person has to pay, we divide the total cost by the number of people who will pay. Each of these things are a rule themselves. I get the total cost by going 26 times the number eating, plus the cost of the cake. I get the number paying by going the number eating minus one, because the birthday girl isn't going to pay.

Teacher: So when you used your rule to calculate a value, you didn't just put the numbers straight into your calculator.

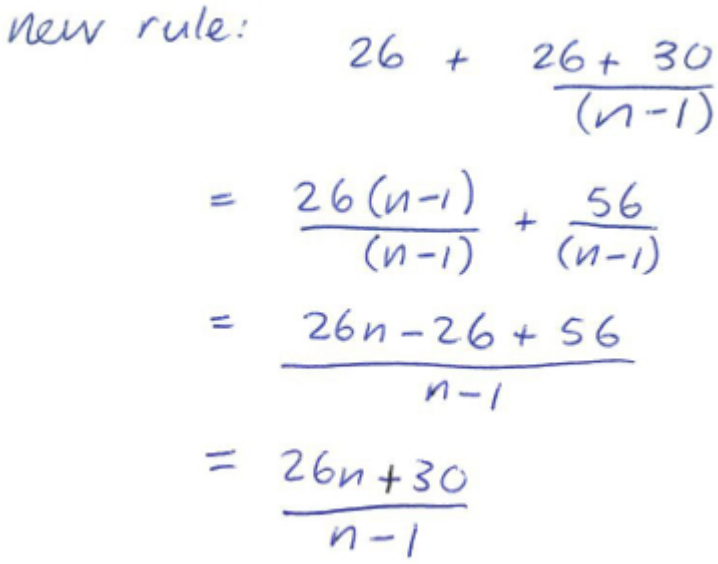
Geoff: Oh, I did at first. But when I just entered the numbers in I got a crazy answer like $314. So I realised that the rule really has brackets around the top and the bottom. So just to be sure, I did some of the working out step by step to get the top and bottom answers out and then divide.

Teacher: Is this the only form the rule could take?

Geoff: No, it does look quite tricky. If I knew what n was to start with, I would have just gone 26 plus 30 is 56, and divided that by n-1 to get the extra people that have to pay and then added that onto 26.

Teacher: Can your rule be rearranged to show this?

Geoff: I'll just try.



Geoff: Yup.