4. 2 Elvira's Equations

A Solidify Understanding Task



Elvira, the cafeteria manager, likes to keep track of the things she can count or measure in the cafeteria. She hopes this will help her improve the efficiency of the cafeteria. To remind herself to keep track of important quantities, she has made a table of variables and descriptions of the things she wants to record. Here is a table of things she has decided to keep track of.

Symbol	(description of what the symbol means in context)	(what is counted or measured)
S	Number of students that buy lunch in the salad line	Studento
W	Number of students that buy lunch in the sandwich line	Students
P	Number of students that buy lunch in the pizza line	Students
F	Number of food servers in the cafeteria	servers
M_T	Number of minutes it takes to serve lunch to all students	minutes
С	Number of classes in the school	Chasses
P_L	Price per lunch	dollars per lunch
A	Average Class Size	Students or class
R	Revenue	dollors
T	Total # of sholents who eat lunch	Students
D_F	Revenue Der Server	dollars
М	# of minutes to serve each statent	minutes

Elvira has written the following equation to describe a cafeteria relationship that seems meaningful to her. She has introduced a new variable A to describe this relationship.

Sudents

Average Class $A = \frac{S+W+P}{4}$ classes

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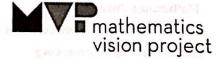
1. What does A represent in terms of the school and the cafeteria? Record this information in the table above.

Average Class Size

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2. Using what you know about manipulating equations, solve this equation for $S = S + W + P$ (C) $A = S + W + P$ (C) $A = S + W + P$ (C) $A = S + W + P$	S. Your solution and <i>P.</i>
A C = $S + W + P$ AC-P-W = S 3. Does your expression for S make sense in terms of the meanings of the other Explain why or why not. A verage Class S f	variables?
4. What does R represent in terms of the school and the cafeteria? Record this in the table above. R - Revenue	nformation in
5. Using what you know about manipulating equations, solve this equation for P $ \begin{array}{c} R = P_L (S + \omega + P) \\ \hline (S + \omega + P) \end{array} $ $ \begin{array}{c} S + \omega + P \end{array} $ $ \begin{array}{c} S + \omega + P \end{array} $	
6. Does your expression for P_L make sense in terms of the meanings of the other Explain why or why not. Revenue 7. Elvira notices that she uses the expression $S + W + P$ a lot in writing other expression using the variable T , so that $T = S + W + P$. represent in terms of the school and the cafeteria? Record this information in	ressions. She
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Flying is having a second seco	
Elvira is having a meeting with the staff members who work in the lunchroom. She has created a couple of new equations for the food servers. $D_F = \frac{f \cdot P_L}{F}$ $M = \frac{M_T}{T}$	
created a couple of new equations for the food servers.	
Rowning Total tints	
Revenue $\rightarrow D_F = \frac{Y \cdot P_L}{F}$ $M = \frac{M_T}{T}$ $M = \frac$	
be poor	
8. a. What does D_F represent in terms of the school and the cafeteria? Record this information	
In the table above. Dr - Revenue per food source	
b. Solve this equation for P_L . Describe why your solution makes sense in terms of the other	
111	
CF Det Det Det server	
31 = This sydem's	
F.D = T.P. price per TE Total # Statents	
9. a. What does M represent in terms of the school and the cafeteria? Record this information	
	_
in the table above. $M-4$ of mindes to seve each stident	
b. Solve this equation for T. Describe why your solution makes sense in terms of the other	
variables. W=M= (T) W=Stribe why your solution makes sense in terms of the other variables. Variables.	
T PIT OBOECONO	
TM=M- Me # of mindes to	
10. One of the staff members suggests that they need to write expressions for each of the	
following. Using the variables in the table, what would these expressions look like?	
a. The average number of students served each minute $A = \frac{1}{100}$	
b. The average number of minutes students wait in the pizza line	
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