



Math Olympiad and Problem Solving Programs

F130 - Advanced Problem Solving

Problem Set 14.1 - Rate

Name:

Date:

1.
2.
3. If Melissa deposits \$912 in 6 months, then she deposits $\$912 \div 6 = \152 per month. We want to know how much she will save in $2\frac{1}{6}$ years. How many months is this? The 2 years = 24 months, and $\frac{1}{6}$ years is $\frac{1}{6} \times 12 = 2$ months. So over the course of $24 + 2 = 26$ months, she will save $\$152 \times 26 =$
4.
5.
6.
7.
8. If it takes 9 workers 10 hours to complete a job, and then we reduce the amount of workers, now everyone has to do more work and it will take longer since there are less people. So our answer must be greater than 10 hours.

Imagine the job is split up into 9ths, one ninth for each worker. It takes each worker 10 hours to do his ninth of the job. However, one worker doesn't show up, so the other 8 guys have to do the last ninth of the job together. It takes 10 hours to do a ninth of the job, and there are 8 guys doing the ninth, so they each work $10 \text{ hours} \div 8 \text{ workers} = 1.25$ hours extra.

So in total, it takes 8 workers $10 + 1.25 =$.
9. If Aaron takes 20 hours to paint a house, then he paints $\frac{1}{20}$ of the house in one hour. If Bob takes 30 hours to paint the same house, he paints $\frac{1}{30}$ of the house in one hour. So if they work together, they paint $\frac{1}{20} + \frac{1}{30} = \frac{1}{12}$ of the house in one hour. So if they can paint $\frac{1}{12}$ of the house in an hour, then they will finish the whole house in .
10. One man takes one day to dig $2 m \times 2 m \times 2 m = 8m^3$ hole. The $4 \times 4 \times 4$ hole can be imagined as a bunch of the $2 \times 2 \times 2$. But how many? The big hole has $4 m \times 4 m \times 4 m = 64m^3$, so there are $64 \div 8 = 8$ little holes to dig in the big hole. If there are 3 men working on the big hole that is the size of 8 little holes, then in the first day, they dig 3 of the 8 little holes. On the second day, they dig 3 more little holes, so a total of 6 holes. On the last day, there are 2 little holes left to dig. They each dig 1 little hole per day, so if each of them digs on the 2 little holes, then it takes $2 \text{ holes} \div 3 \text{ men} = \frac{2}{3}$ of a day. So it takes .