

MATHCOUNTS® Problem of the Week Archive

Summer Jobs – July 8, 2019

Problems & Solutions

This summer Owen and Jack will both have part time jobs. Owen will be working as a lifeguard and Jack will be working as a server at a local restaurant. Owen plans to work 15 hours each week and will be making \$7 per hour. Jack will make an hourly rate of \$2.10 plus 18% of his sales in tips. If Jack averages \$30 in sales per hour, how many hours will he need to work in order to make the same amount per week as Owen?

Owen will make $\$7/\text{hour} \times 15 \text{ hours/week} = \$105/\text{week}$. Jack will make $\$2.10/\text{hour} + 0.18 \times \$30/\text{hour} = \$7.50/\text{hour}$. In order to make the same amount per week as Owen, Jack will need to work $\$105/\text{week} \div \$7.50/\text{hour} = \mathbf{14}$ hours/week.

Owen and Jack will both work 15-hour weeks, but Jack's paychecks will be reduced by 6% for state income tax. What will be the absolute difference in Owen and Jack's weekly pay?

Owen will be making \$105 per week, as calculated in the previous solution. Jack will be making $\$7.50/\text{hour} \times 15 \text{ hours} = \112.50 but will then pay a 6% state income tax. Jack will actually take home $(1 - 0.06) \times \$112.50 = 0.94 \times \$112.50 = \$105.75$ per week. Jack will make $\mathbf{\$0.75}$ more per week than Owen.

At the end of the summer, Jack and Owen each will have worked for 12 weeks. They plan to combine their earnings in a joint account to save to buy a used car when they get their licenses. If the account earns 4% interest annually, what is the total amount Jack and Owen will have in their savings account in two years when they get their licenses?

Jack will earn \$105.75 per week, and Owen will earn \$105 per week. Collectively, at the end of the summer, they will have earned $12 \times (\$105.75 + \$105) = 12 \times \$210.75 = \2529 . After one year they will have $1.04 \times \$2529 = \2630.16 in their account. After two years they will have $1.04 \times \$2630.16 = \mathbf{\$2735.37}$.

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