

# MATHCOUNTS<sup>®</sup> Problem of the Week Archive

## Summer Jobs – June 12, 2023

### 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  $1.04 \times \$2630.16 = \mathbf{\$2735.37}$ .*

# **MATHCOUNTS<sup>®</sup> Problem of the Week Archive**

## ***Summer Jobs – June 12, 2023***

### ***Problems***

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 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?

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?