

Name _____ Date _____

Which Is the Best Method? Using Graphing, Substitution, and Linear Combinations

Problem Set

Write a system of equations to represent each problem situation. Solve the system of equations using any method and answer any associated questions.

- Jun received two different job offers to become a real estate sales agent. Dream Homes offered Jun a base salary of \$20,000 per year plus a 2% commission on all real estate sold. Amazing Homes offered Jun a base salary of \$25,000 per year plus a 1% commission on all real estate sold. Determine the amount of real estate sales in dollars for which both real estate companies will pay Jun the same amount. Explain which offer Jun should accept based on the amount of real estate sales he expects to have.

Let x represent the amount of Jun's real estate sales in dollars. Let y represent the yearly income when Jun has x dollars in real estate sales.

$$\begin{cases} y = 0.02x + 20,000 & \text{Dream Homes} \\ y = 0.01x + 25,000 & \text{Amazing Homes} \end{cases}$$

One possible solution path:

Substitution Method:

$$\begin{aligned} 0.02x + 20,000 &= 0.01x + 25,000 & y &= 0.02(500,000) + 20,000 \\ 0.01x + 20,000 &= 25,000 & y &= 10,000 + 20,000 \\ 0.01x &= 5000 & y &= 30,000 \\ x &= 500,000 \end{aligned}$$

The solution is (500,000, 30,000). Both real estate companies will pay Jun \$30,000 per year for \$500,000 in real estate sales. If Jun expects to sell less than \$500,000 of real estate per year, then he should accept the offer from Amazing Homes. If Jun expects to sell more than \$500,000 of real estate per year, then he should accept the offer from Dream Homes.

2. Stella is trying to choose between two rental car companies. Speedy Trip Rental Cars charges a base fee of \$24 plus an additional fee of \$0.05 per mile. Wheels Deals Rental Cars charges a base fee of \$30 plus an additional fee of \$0.03 per mile. Determine the amount of miles driven for which both rental car companies charge the same amount. Explain which company Stella should use based on the number of miles she expects to drive.

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3. Renee has two job offers to be a door-to-door food processor salesperson. Pro Process Processors offers her a base salary of \$15,000 per year plus an additional \$25 for each processor she sells. Puree Processors offers her a base salary of \$18,000 per year plus an additional \$21 for each processor she sells. Determine the number of food processors Renee would have to sell for both companies to pay her the same amount. Explain which job offer Renee should accept based on the number of food processors she expects to sell.

4. Alex needs to rent a bulldozer. Smith's Equipment Rentals rents bulldozers for a delivery fee of \$600 plus an additional \$37.50 per day. Robinson's Equipment Rentals rents bulldozers for a delivery fee of \$400 plus an additional \$62.50 per day. Determine the number of rental days for which both rental companies charge the same amount. Explain which company Alex should choose based on the number of days he expects to rent a bulldozer.

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5. Serena has job offers from two car dealerships. Classic Cars offers her a base salary of \$22,000 per year plus an additional 1% commission on all sales she makes. Sweet Rides offers her a base salary of \$13,000 per year plus an additional 2.5% commission on all sales she makes. Determine the amount of car sales in dollars for which both dealerships will pay Serena the same amount. Explain which offer Serena should accept based on the amount of car sales she expects to have.

6. Dominique is trying to choose a satellite Internet service provider. Reliable Satellite charges customers a monthly fee of \$26 plus an additional \$0.30 per hour of online time. Super Satellite charges customers a monthly fee of \$18 plus an additional \$0.50 per hour of online time. Determine the number of hours of online time for which both providers charge the same amount. Explain which provider Dominique should choose based on the number of hours she expects to spend online each month.