Word Problems Leading to Equations

Grade 7 Place Value Worksheet

Date:_____   Name:_____

LET'S MAKE WORD PROBLEMS LEADING TO EQUATIONS EASY

Solve the following problems

1. Audrey bought 200 business cards and paid $23. She ordered 500 business cards a few months later and paid $35. Find the cost to order 700 business cards

2. Alexa is on a diet to lose some weight. He is losing weight at a rate of 2 pounds per week. After 6 weeks, he weighs 205 pounds. Find how many weeks it will take Alexa to reach his target weight of 175 pounds.

3. As the HR, you prepare the budget for your company rafting trip. Each large raft costs $100 to rent and each small raft costs $40 to rent. You have $1600 to spend. Find the number of small rafts you can rent if you rent 12 large rafts.

4. I rent a gym for 30 students and the cost is $150. Another time I rent the gym for 70 students and the cost is $270. What is the fixed rate?

5. A bus company took a tour bus on the ferry when there were 30 people aboard. The ferry charged the bus company $180. The following week, the bus had 50 people on board and the ferry charged them $220. How much is the **base rate** for the empty bus?

6. Amanda purchased a Bloodgood Japanese Maple tree. In two years, the tree was 7′ tall and in 10 years the tree grew to its mature height of 15′. Write an equation in slope-intercept form that shows the number of years, t, it takes to reach a certain height, h.

7. A bus company took a tour bus on the ferry when there were 30 people aboard. The ferry charged the bus company $180. The following week, the bus had 50 people on board and the ferry charged them $220. Show this

using $y = mx + b$ form.

8. As the HR, you prepare the budget for your company rafting trip. Each large raft costs $100 to rent and each small raft costs $40 to rent. You have $1600 to spend. Write an equation in standard form to describe the situation.

9. Audrey bought 200 business cards and paid $23. She ordered 500 business cards a few months later and paid $35. Write a linear equatioin to describe the situation.

10. Alexa is on a diet to lose some weight. He is losing weight at a rate of 2 pounds per week. After 6 weeks, he weighs 205 pounds. Write a linear equation for the situation.

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Answers

1. Let's denote business card as x and the cost as y.
   y = $43

2. It will take 21 weeks for Alex to reach his target weight of 175 pounds.

3. x=10

4. $60

5. $120

6. The equation in slope-intercept form is:
   $h = t + 5$

7. y = 2x + 120

8. 100y + 40x = 1600

9. y = 0.04x + 15

10. y=2x+217

1. Let's denote business card as x and the cost as y.
   Find slope, m= $\frac{y_2-y_1}{x_2-x_1}$

   m = $\frac{35-23}{500-200}$ = $\frac{12}{300}$ = 0.04
   Find b using m = 0.04; point (200:23)
   y = mx+b
   23 = 0.04(200) + b
   b= 15

   From y=mx+b   (where x = 700)
   y= 0.04(700)+15
   y = $43

2. Alex is on a diet to lose some weight. He is losing weight at a rate of 2 pounds per week. After 6 weeks, he weighs 205 pounds
   Given:
   $175 = -2x + 217$
   Here we can see that Alex is losing weight at a consistent rate of 2 pounds per week, we will write a linear equation to represent Alex weight after a certain weeks.
   Linear equations, y = mx + b, where,
   y = Total Alex weight
   m = slope/rate = 2 pounds/weeks
   x = independent variable (numbers of week)
   b = Alex initial value.
   In this case, since, we are shown that Alex loses 2 pounds per week and after 6 weeks he weighs 205, then, Alex's original weight = 205 + 12 = 217.
   Now, according to our variables, we can set up our linear equation and solve:
   175 = -2x + 217
   175 - 217 = -2x
   $\frac{-42}{-2} = \frac{-2x}{-2}$
   x = 21 weeks
   Therefore, 21 weeks it will take Alex to reach his target weight of 175 pounds.

3. Based on the given conditions, formulate: $12 \times 100 + 40 \times x = 1600$
   Calculate the product or quotient: $1200 + 40x = 1600$
   Rearrange unknown terms to the left side of the equation: $40x = 1600 - 1200$
   Calculate the sum or difference: $40x = 400$
   Divide both sides of the equation by the coefficient of variable:
   x=$\frac{400}{40}$;   x=10

4. Let's denote the students as x and the cost as y.
   Find slope, m=$\frac{y2-y1}{x2-x1}$
   m $= \frac{270-150}{70-30} = \frac{120}{40} = 3$
   Find b using m = 3; point (150:30)

   y = mx+b
   $150 = 3(30) + b$
   b= \$60

5. Let's denote the people as x and the cost as y.
   Find slope m=$\frac{y2-y1}{x2-x1}$
   m $= \frac{220-180}{50-30} = \frac{40}{20} = 2$
   Find b using m = 2; point (220:50);
   y = mx+b
   $220 = 2(50) + b$
   b= \$120

6. The tree starts at a height of 7' in two years (t=2), and it grows to its mature height of 15' in 10 years ($t = 10$).
   Let m be the slope (rate of growth) and b be the y-intercept (initial height). The slope (m) is calculated as the change in height divided by the change in time.
   The change in height (h) is $15 - 7 = 8$ and the change in time (t) is: $10 - 2 = 8$ years.
   So, the slope (m) is $=\frac{8}{8} = 1$
   Now, we can use the slope-intercept form ($y = mx + b$):
   $h = mt + b$ Substitute in the values: $h = t + b$ Now, we know that when $t = 2$, $h = 7$ Substitute these values to solve for b:
   $7 = 2 + b$
   Solving for b:
   b=5
   Therefore, the equation in slope-intercept form is: h=t+5
   This equation represents the relationship between the number of years (t) and the height of the Bloodgood Japanese Maple tree (h).

7. y = 2x + 120

8. 100y + 40x = 1600

9. y = 0.04x + 15

10. y=2x+217