Name:_____Date:_____Per:____

Homework: Linear Equations Word Problems

Directions: Read the scenario and answer the questions below.

Scenario 1: In 2018, the current population of Little Town is 32,000 and town officials estimate that the population will continue to grow by 900 every year.

a. What is the initial value (y-intercept) and what does it represent in this situation?

32,000 → current population

b. What is the constant rate of change (slope) and what does it represent in this situation?

900 → population ↑ 900 every year

c. Write an equation that models the population, x years from now using the formula **y = mx + b**.

$y = 900x + 32{,}000$

d. What will the population of the town be in 2026 years?

in 8 years

population @

39,200

$y = 900(8) + 32{,}000$

$y = 7{,}200 + 32{,}000$

$y = 39{,}200$

e. In what year will the population reach 45,500 people?

$45{,}500 = 900x + 32{,}000$

$-32{,}000 \quad -32{,}000$

$\frac{13{,}500}{900} = \frac{900x}{900}$

$15 = x$

in 15 years from 2018

2035

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Scenario 1: In 2018, the current population of Little Town is 32,000 and town officials estimate that the population will continue to grow by 900 every year.

a. What is the initial value (y-intercept) and what does it represent in this situation?

b. What is the constant rate of change (slope) and what does it represent in this situation?

c. Write an equation that models the population, x years from now using the formula **y = mx + b**.

d. What will the population of the town be in 2026 years?

e. In what year will the population reach 45,500 people?

Scenario 2: Immediately after giving birth on May 1st, one woman weighed 177 pounds (lbs). She loses approximately 4 lbs per month. Her goal is to get back to her pre pregnancy weight of 135lbs.

a. What is the initial value (y-intercept) and what does it represent in this situation?

177 lbs → weight after pregnancy

b. What is the constant rate of change (slope) and what does it represent in this situation?

−4lb → drop 4 lbs per month

c. Write an equation that models the woman's weight loss per month using the formula **y = mx + b**.

$y = -4x + 177$

d. What will her weight be in 3.5 months (August 15th) after giving birth?

$y = -4(3.5) + 177$

$y = -14 + 177$

$y = 163$ lbs

She will weigh 163lbs. in 3.5 months

e. In what month will she reach her goal of 135 lbs?

$135 = -4(x) + 177$

$-177 \quad -177$

$\frac{-48}{-4} = \frac{-4x}{-4}$

$12 = x$

in 12 months so May of next year.

Scenario 2: Immediately after giving birth on May 1st, one woman weighed 177 pounds (lbs). She loses approximately 4 lbs per month. Her goal is to get back to her pre pregnancy weight of 135lbs.

a. What is the initial value (y-intercept) and what does it represent in this situation?

b. What is the constant rate of change (slope) and what does it represent in this situation?

c. Write an equation that models the woman's weight loss per month using the formula **y = mx + b**.

d. What will her weight be in 3.5 months (August 15th) after giving birth?

e. In what month will she reach her goal of 135 lbs?