

LINEAR EQUATIONS – SUPPLEMENTAL NOTES

1. CHILDHOOD WEIGHT

A baby weighs 10 pounds at birth, and three years later the child's weight is 30 pounds. Assume that childhood weight W (in pounds) is linearly related to age t (in years).

- a. Write two ordered pairs that relate the above information to each other.

HINT: Instead of (x, y) , our ordered pairs will be (t, W)

- b. Express W (y -value) in terms of t (x -value). This means find a linear equation that models childhood weight. You have two points from (a), so find the slope, then use point-slope formula.

- c. What is the child's weight on their 6th birthday? ($t = 6$, find W)

- d. How old is the child when they weigh 70 pounds? ($W = 70$, find t)

2. LOAN REPAYMENT

A college student receives an interest-free loan of \$8,250 from a relative. The student will repay \$125 per month until the loan is paid off. Express the amount P (in dollars) remaining to be paid in terms of time t (in months).

- a. Instead of (x, y) , our ordered pairs will be _____.

- b. Write two order pairs.

- c. Find the linear equation that expresses the amount P (in dollars) remaining to be paid in terms of time t (in months).

- d. After how many months will the students owe \$5000?

- e. How long will it take to pay off the loan?

3. WAGES

A manufacturer pays its assembly line workers \$11.50 per hour. In addition, workers receive a piecework rate of \$.75 per unit produced.

- a. Write a linear relationship for the hourly wage W in terms of the number of units, x , produced per hour.
- b. How many units by a particular worker are produced per hour if their hourly wage is \$19?

4. ITEM PRODUCTION

In planning for a new item, a manufacturer assumes that the number of items produced and the cost in dollars of producing these items are related by a linear equation. Projections are that 100 items will cost \$11,000 to produce and that 300 items will cost \$21,000 to produce. Find the equation that relates the number of items produced to the cost.