Module 14: Student Activity

Understanding Linear Equations

Through this activity, students will explore linear equations by examining common financial instruments and investments, such as stocks, bonds, and mutual funds. By understanding how linear equations apply to different financial instruments, students will be able to make informed decisions about their investments and understand the impact of different financial decisions.

1. Identify the slope and initial value for each equation below

a. y = -5x + 12

b. y = -35x + 120

c. $y = \frac{1}{2}x + 5$

2. Ahmad has $112 in his checking account and earns $75 per week working part-time. Assume he has no expenses currently.

a. Initial value:

b. Slope:

c. Write an equation to show his account balance, y, after x weeks.

d. How much does he have after one year (52 weeks)? Use the equation you wrote in part c.

x	y

3. Match each equation with the situation it represents, where y is account balance and x is number of weeks.

a. A -$5 balance with a $32 weekly overdraft fee — I. y = -5x + 32

b. A $5 balance with a weekly $32 deposit. — II. y = 5x - 32

c. A $32 balance and $5 weekly minimum balance fee — III. y = 32x + 5

d. A -$32 balance with a $5 weekly deposit — IV. y = -32x - 5

4. Fatima has $207 in her account. A $7.25 fee is charged each month the balance is below $100. She withdraws $120 one time.

a. Write an equation to model her balance after x months since the withdrawal, if she makes no further deposits or withdrawals.

b. Solve for y when x=4. What does that mean in this context?

c. After how many months will Fatima's balance reach $0 or below?

5. **Leyla's old account had a $3.50 ATM fee, so she decided to change to a free student checking account with no ATM fees.**
    a. Write an equation to represent how much money Leyla saves on fees (y) depending on how many times she uses an ATM (x).

    b. How much does Leyla save if she uses the ATM 8 times?

6. **Walmart charges a $4 fee to cash a check that is worth up to $1000.**
    a. Write an equation to represent the total amount you'll pay in fees, y, if you deposit x number of $500 checks.

    b. Imagine you deposit four checks per month. Write an equation to model the total you pay in check cashing fees, y, after x months.

7. **Many grocery stores have machines that will give cash for your change but charge a fee.**
    a. Coinstar charges an average fee of 11.9% of your coins' value. Write an equation that models the total fee you pay (y) based on the value of your coins (x) if you use a Coinstar machine.

    b. ChangeMaker has a coin machine that charges a $1 flat fee, plus 5% of your coins' value. Write an equation to model the fee you pay (y) based on the value of your coins (x).

    c. Imagine you have $13.65 in coins that you want to exchange for bills. How much would you pay in fees at each machine? Round your answer to the nearest cent.

    d. When is the ChangeMaker a better deal than the Coinstar? Why?

8. **Angel's bank allows 3 free ATM withdrawals each month, then charges a $5 ATM fee.**
    a. Write an equation to model how much Angel will pay in fees (y) based on their number of ATM withdrawals (x).

    b. Based on your equation, how much will Angel pay in fees if they make 0 withdrawals? Why doesn't that value make sense in the context of the problem?