

Accelerated 7 • Unit 5 Worksheet

Linear Relationships

Name: _____

Date: _____

Part A • Proportional Relationships

1. A printer prints 4 pages every 10 seconds.

a. Is this proportional? How do you know?

b. Write an equation relating pages (p) and seconds (s).

c. What is the constant of proportionality? What does it MEAN?

Part B • Linear Relationships in Many Forms

2. A taxi charges a \$4 booking fee plus \$2.50 per mile. Let m = miles, C = total cost. Fill in the table and write the equation.

$m=0$: $C=$ _____ $m=2$: $C=$ _____ $m=5$: $C=$ _____ $m=10$: $C=$ _____

Equation: $C =$ _____

Is this proportional? Why or why not?

3. A table shows: (0, 5), (2, 11), (4, 17), (6, 23), (10, 35). Is this linear? Proportional? Explain.

Part C • Finding Slope and Equations of Lines

4. Find the equation of the line through (1, 5) and (4, 11) in $y = mx + b$ form. Show your work.

5. A line has slope $-3/4$ and y-intercept 6.

a. Equation:

b. Find x when $y = 0$:

c. What does the y-intercept mean if x = years and y = dollars in an account?

Part D • Systems of Linear Equations

6. Solve the system algebraically AND describe how the lines look on a graph (slope and y-intercept of each).

System: $y = 2x + 1$ AND $y = -x + 7$

a. Algebra:

b. Slopes and y-intercepts:

Solution: (____ , ____)

7. Two phone plans: Plan A costs \$0.05 per minute. Plan B costs a \$10 flat fee plus \$0.02 per minute. Set up and solve a system to find when the plans cost the same.

Part E • Associations in Data

8. A scatter plot of (hours studied, test score) shows a strong positive trend. The line of fit is $y = 4x + 60$.

a. Predict the score for 8 hours of study.

b. Interpret the slope IN CONTEXT.

c. Interpret the y-intercept IN CONTEXT. Does it make sense?

d. Would you trust this model for 25 hours of study? Explain.

Part F • Thinking Deeply

9. Two lines have the same slope but different y-intercepts. How many solutions does the system of these two equations have? Why?

10. Andre and Mai are racing. Andre starts at the 20-meter mark and runs 4 m/s. Mai starts at 0 and runs 6 m/s.

a. Write equations for each runner's position over time.

b. When and where does Mai catch up?

c. What does the y-intercept mean? What does the slope mean?

11. Two cities collected (precipitation, plant growth) data. City X showed positive correlation. City Y showed nearly zero correlation. Does that mean precipitation doesn't matter in City Y? Give two PLAUSIBLE explanations.
