

Lesson 18 Practice Problems

1. Two cyclists, A and B, are going on a bike ride and are meeting at an orchard. They left home at the same time.

Functions A and B give their distance from the orchard, in miles, after riding for x hours. The functions are defined by these equations:

$$A(x) = 48.5 - 21x$$

$$B(x) = 42 - 16.8x$$

For each question, explain or show your reasoning.

- Which cyclist lives farther away from the orchard?
 - Who will get to the orchard first? How much earlier will that cyclist arrive?
 - Is there a time when both cyclists are the same distance from the orchard?
2. Each equation defines a function. Write an equation for the inverse function.
- $y(x) = 65 + 5x$
 - $f(t) = 3.5 - 0.5t$
 - $P(n) = \frac{n}{3} - 1.2$

(From Unit 4, Lesson 17.)

3. The number of chirps that crickets make is closely related to the temperature of their environment. When the temperature is between 12 and 38 degrees Celsius, we can tell the temperature by counting the number of chirps!

A formula that is commonly used to find the temperature in degrees Celsius is:

Count the number of chirps in 25 seconds, divide by 3, then add 4 to get the temperature.

Let m be the number of chirps that crickets make in 25 seconds and C be the temperature in degrees Celsius.

- a. What is the temperature when 84 chirps are heard in 25 seconds?

- b. Write an equation that defines C as a function of m .

- c. How many chirps would we expect to hear in 25 seconds when it is 14 degrees Celsius?

- d. Write an equation that defines the inverse of the function you wrote. Explain what the inverse function tells us about the situation.

(From Unit 4, Lesson 16.)

4. A college student borrows \$360 from his cousin to repair his car. He agrees to pay \$15 per week until the loan is paid off.
- a. Function L represents the amount owed, w weeks after the student borrows the money. Write an equation to represent this function. Use function notation.

 - b. Write an equation to represent the inverse of function L . Explain what information it tells us about the situation.

c. How many weeks will it take the student to pay off the loan?

(From Unit 4, Lesson 17.)

5. A family bought a used car that had been driven 12,000 miles.

The table shows the total distance, in miles, that the car has traveled each year since the purchase.

years since purchased	total miles traveled
0	12,000
1	15,140
2	18,525
3	21,750

- On average, how many miles does the family drive each year? Explain or show your reasoning.
- Write an equation that could define function M , which gives the total miles traveled, t years since the purchase. Use function notation.
- Write an equation that is the inverse of function M . Explain what information it tells us about the situation.
- If the family's driving trend continues, when will the car have traveled 50,000 miles? Explain or show your reasoning.

(From Unit 4, Lesson 17.)