

KEY

Rate of Change Homework

A pest service charges a fee of \$50 to come to your home and trap squirrels and then an additional charge of \$15 per squirrel that is trapped and removed.

1. Fill in the following table of data and construct an equation using the information above.

# squirrels (s)	0	1	2	3	4	5	6	7	8	9
cost of removal y = C(s)	50	65	80	95	110	125	140	155	170	185

2. Graph the data. Is the graph linear or non-linear?

linear

3. Write an equation that represents this situation.

$$y = 15x + 50$$

4. What is the rate for catching a squirrel?

\$15 per squirrel

5. Determine the rate of change for trapping:

a. 0 - 2 squirrels:

$$\frac{80 - 50}{2 - 0} = \frac{30}{2} = 15$$

b. 3 - 5 squirrels:

$$\frac{125 - 95}{5 - 3} = \frac{30}{2} = 15$$

c. 6 - 9 squirrels:

$$\frac{185 - 140}{9 - 6} = \frac{45}{3} = 15$$

6. Calculate the average rate of change. Is it the same? If so, explain why.

avg. ROC is also 15 because it costs \$15 per squirrel trapped.

7. Is there a fixed cost? What is it?

yes - \$50 to come to your home

8. What is C(0)? Why is there still a cost if no squirrels are caught?

C(0) = 50. there's a cost for them to come to your home.

9. What is C(3)? Write what this means in your own words.

C(3) = 95. if they catch 3 squirrels, you pay \$95.

10. Is C(2.5) a possible value? Why or why not?

NO because you can't catch 0.5 of a squirrel.

11. How many squirrels are trapped when the cost is \$140? Use function notation.

$$140 = 15x + 50 \rightarrow \boxed{x = 6} \quad C(6) = 140$$

12. State the domain and range.

Domain: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

Range: $\{50, 65, 80, 95, 110, 125, 140, 155, 170, 185\}$

