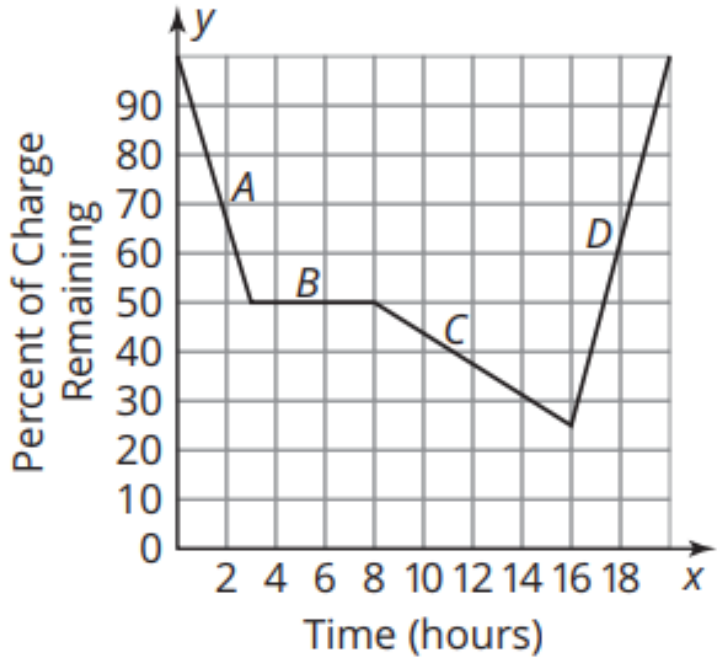
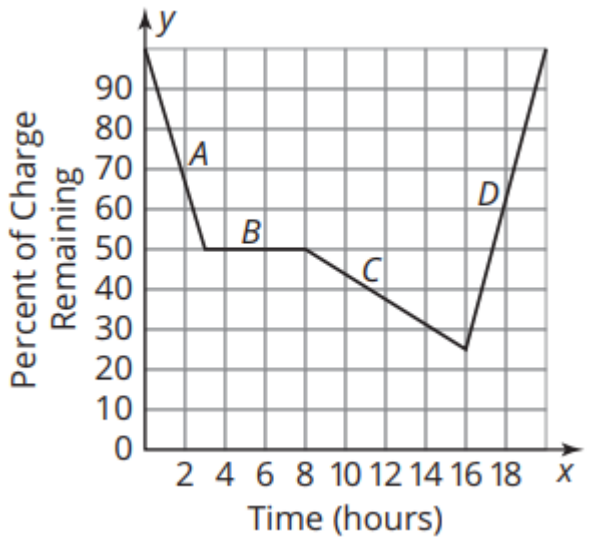
The graph shows the percent of the charge remaining on a cell phone battery over time.



1. **Describe the type of function shown in the graph.**

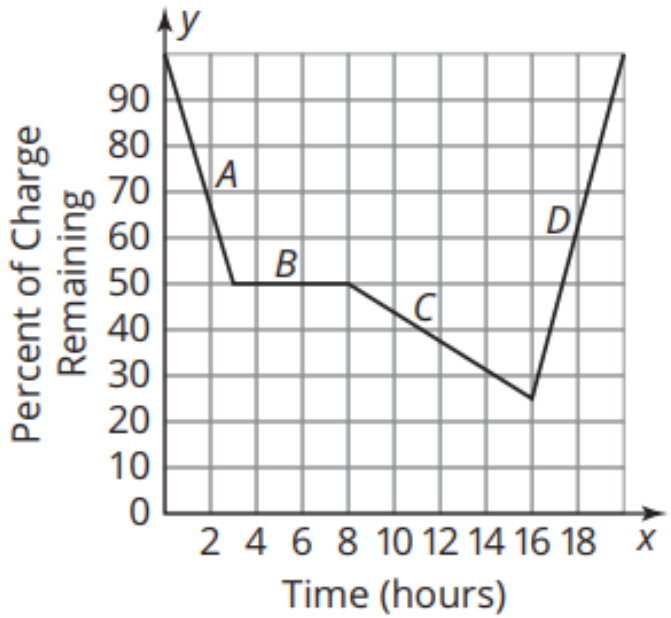
2. **Write a possible scenario that models the graph.**

3. **Explain how you know the graph represents a function in terms of this problem situation. Then, write a function $f(x)$ to model the graph. Define your variables.**



4. **Determine the slope, x-intercept(s), and y-intercept. Explain what each means in terms of this problem situation.**

5. Determine which piece(s) of the graph can be described by each statement.



a. The cell phone was not in use.

b. The cell phone battery was recharging.

c. The cell phone was in use.

d. The cell phone battery was fully charged.

e. The cell phone battery was half-charged.

6. Determine whether each statement is true or false. If it is false, explain why it is false.

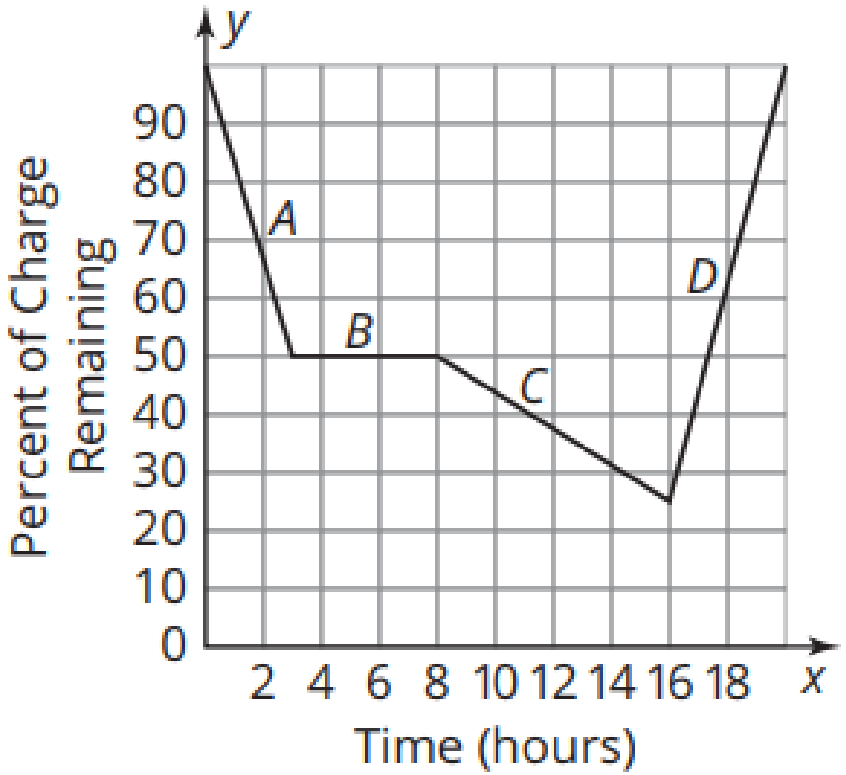
a. The cell phone battery died after 20 hours.

b. The cell phone battery lost 25% of its charge during an 8-hour period.

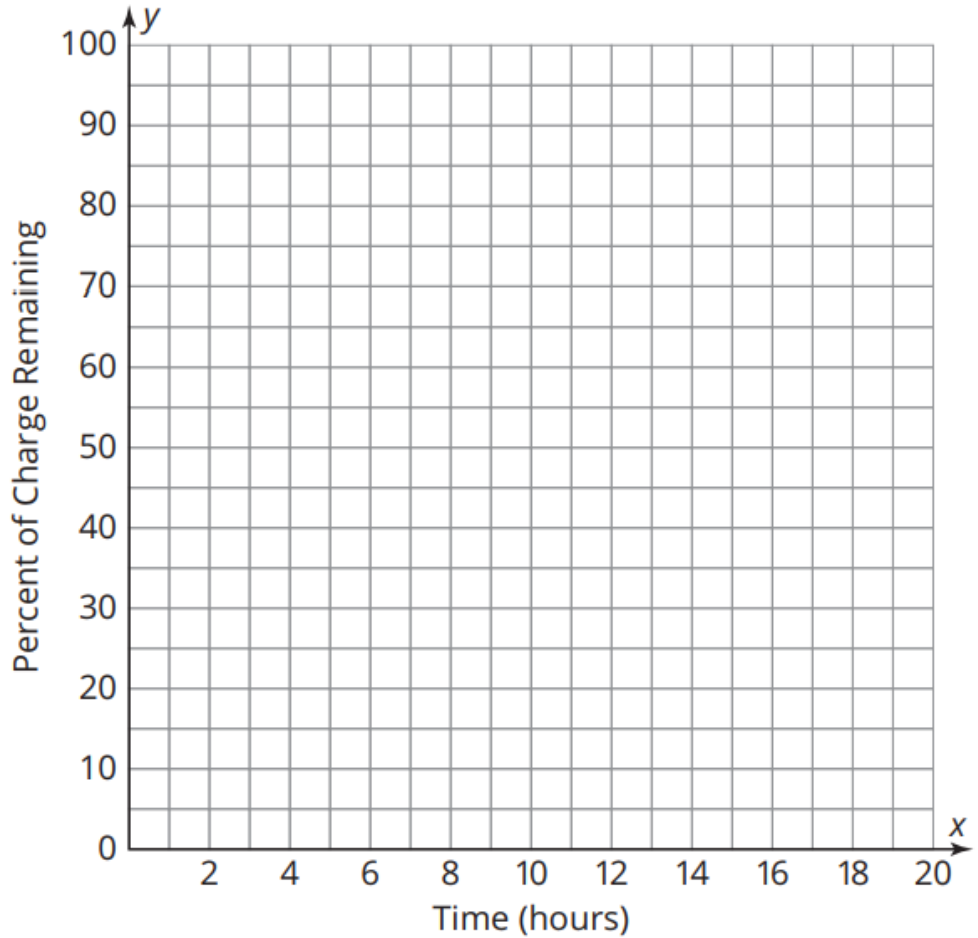
c. The cell phone was used the most between the 16th and 20th hours.

d. The cell phone battery was charged twice.

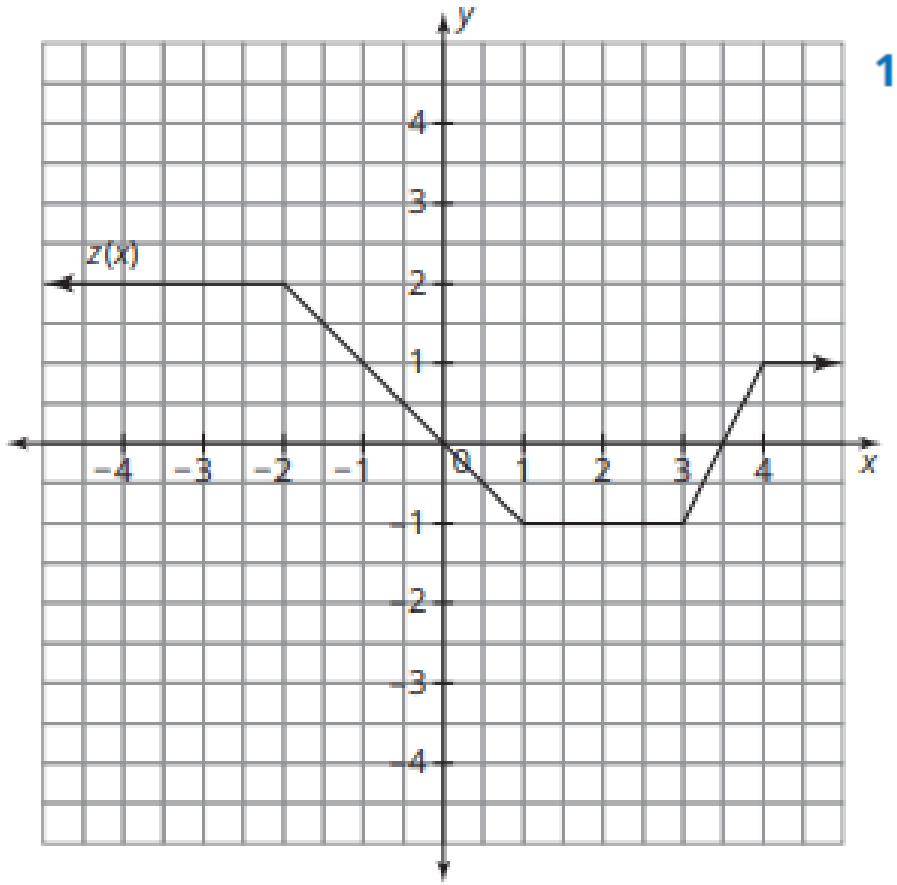
e. After the first 3 hours, the battery had half the charge it began with.



7. Write a scenario to model your own cell phone use during a typical day. Give your scenario to your partner and have them graph it while you graph your partner's scenario. Then, work together to determine the equation of each piecewise function.



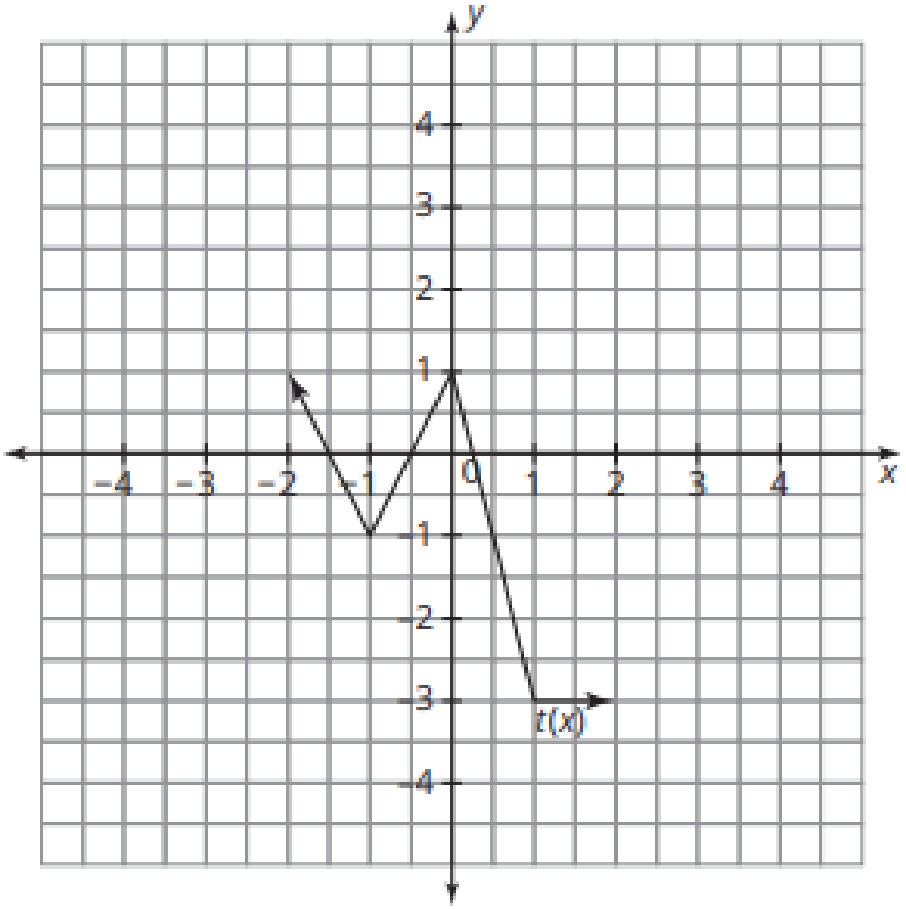
ACTIVITY
3.3 Transformations of Piecewise Functions



1. The graph of a function $z(x)$ is shown. Sketch the graphs of $z'(x)$ and $z''(x)$.

a. $z'(x) = z(x) + 3$

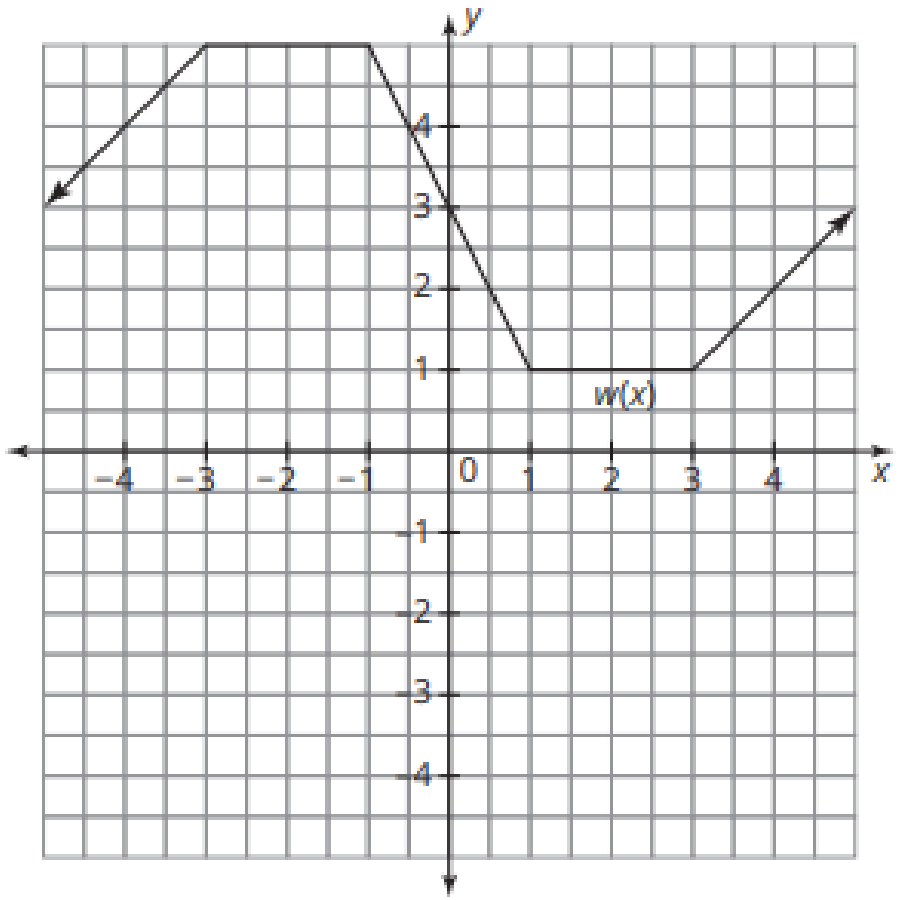
b. $z''(x) = z(x) - 4$



2. The graph of a function $t(x)$ is shown. Sketch the graphs of $t'(x)$ and $t''(x)$.

a. $t'(x) = t(x + 3)$

b. $t''(x) = t(x - 1)$



3. The graph of a function $w(x)$ is shown. Sketch the graphs of $w'(x)$ and $w''(x)$.

a. $w'(x) = -w(x)$

b. $w''(x) = w(-x)$