

ACTIVITY 18

GARBAGE

The table below gives the number of millions of tons of municipal solid waste in the United States from 1960 to 2001. Complete the second row of the table.

Year	1960	1970	1980	1990	1991	1992	1993	1994	2000	2003
TIME since 1960	0	10	20	30	31	32	33	34	40	43
WASTE (million tons)	88	121	152	197	197	203	207	209	223	236

www.epa.gov/epaoswer/non-hw/muncpl/facts.htm and <http://www.eia.doe.gov/cneaf/solar.renewables/renewable.energy.annual/chap03.html>, accessed 06/27/05

- Carefully draw a scatterplot of points (TIME, WASTE) on the grid provided on the last page of this activity.

Remember that TIME represents the number of years since 1960, not the year itself.

Use x-scale = 1 and y-scale = 10 million.

Be sure to label each axis.

- Fit a line to the data by eye and draw a straight line with a ruler.
- Give the coordinates of any two points that lie on the line you drew. **Warning!** A point that is in the table but **not** on your line **cannot** be used.

(31 , 197) (34 , 209)

- Use these two points to find an equation for your line. Show your work.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{209 - 197}{34 - 31} = \frac{12}{3} = 4$$

$$\text{Equation: } y - y_1 = m(x - x_1)$$

$$y - 209 = 4(x - 34)$$

$$y - 209 = 4x - 136$$

$$y = 4x + 73$$

- What is the slope? In a sentence explain what the slope means about the amount of municipal waste.

$$m = 4$$

Waste increases at a rate of 4 million tons per year.

6. What is the y-intercept? In a sentence explain what the y-intercept means about the amount of municipal waste. **$b = 73$, according to the equation; $b = 88$, according to the table data (which is much more accurate). The y-intercept explains that there were about 73 million tons of waste in 1960.**
7. Use your equation to predict the approximate amount of human waste that will occur in the year 2010. Explain your answer in a sentence. Show your work.

$$x = 50$$

By 2010 there will be 273 million tons of waste.

8. Use your equation to predict the approximate amount of human waste that will occur in the year 2050. Explain your answer in a sentence. Show your work.

$$x = 90$$

By 2050 there will be 433 million tons of waste.

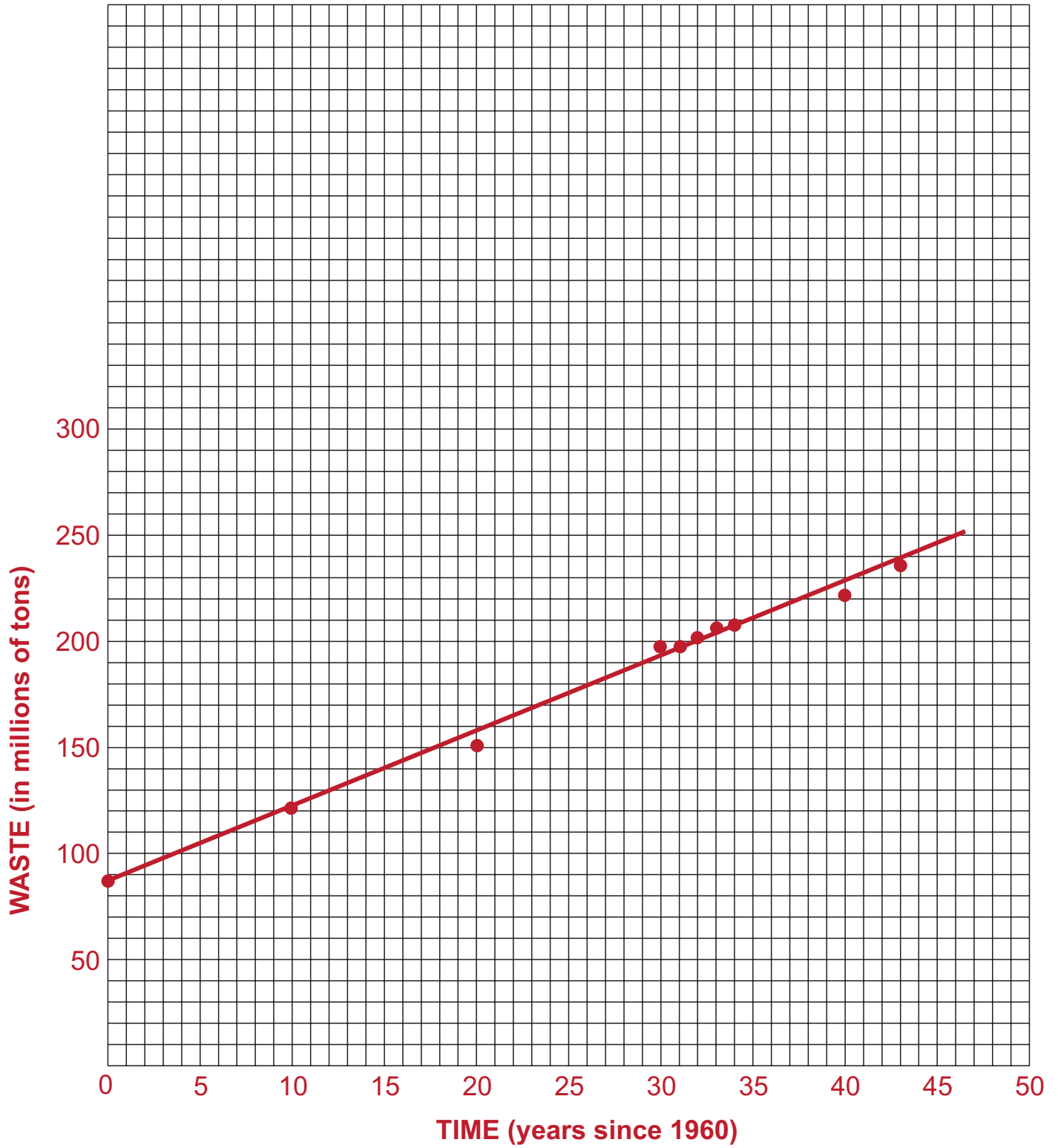
9. Use your equation to predict in what year the approximate amount of human waste will reach 350 million tons. Explain your answer in a sentence. Show your work.

$$350 = 4x + 73$$

$$x = 69.25$$

69 years after 1960 \rightarrow 2029

Graph for Garbage Activity



Student answers should be close to this.