**Evolution of the Telephone**

Most people know that Alexander Graham Bell is commonly credited as the inventor of the telephone. In 1876, Bell was the first to obtain a patent for an "apparatus for transmitting vocal or other sounds telegraphically". Most people don’t know that the first cordless phone was patented in 1959 by Dr. Raymond P. Phillips Sr., an African American inventor from Terrell, Texas. The first cellular network in the world was built in 1977 in Chicago, IL. In 1979 the first cellular network (the 1G generation) was launched in Japan. With the evolution of cell phones, the sales of corded phones slowly phased out.

**Consumer Electronics and Electronic Components – Factory Sales by Product**

**1990 to 2005** [In millions of dollars (11,021 represents $11,021,000,000).]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CATEGORY** | **1990** | **1995** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** |
| **Home office products, total** | 11,021 | 24,140 | 36,854 | 34,924 | 33,505 | 38,282 | 41,770 | 45,032 |
| Cordless telephones | 842 | 1,141 | 1,562 | 1,960 | 1,261 | 1,268 | 1,134 | 1,017 |
| Corded telephones | 638 | 557 | 386 | 294 | 266 | 256 | 259 | 261 |
| Telephone answering devices | 827 | 1,077 | 984 | 1,062 | 1,060 | 1,210 | 1,247 | 1,426 |
| Caller ID devices | (NA) | (NA) | 54 | 35 | 20 | 12 | 13 | 9 |
| Personal computers | 4,187 | 12,600 | 16,400 | 12,960 | 12,609 | 15,584 | 18,233 | 18,215 |
| Computer printers | (NA) | 2,430 | 5,116 | 5,245 | 4,829 | 4,734 | 4,053 | 3,858 |
| Aftermarket computermonitors | (NA) | 879 | 1,908 | 2,173 | 1,670 | 1,856 | 2,214 | 2,315 |
| Modems/fax modems | (NA) | 770 | 1,564 | 1,564 | 1,445 | 1,419 | 1,465 | 1,525 |
| Computer peripherals | 1,980 | 816 | 1,950 | 2,150 | 2,256 | 2,707 | 3,032 | 3,575 |
| Computer software | 971 | 2,500 | 4,480 | 5,062 | 4,961 | 5,060 | 5,162 | 5,250 |
| Personal word processors | 656 | 451 | 240 | 97 | 36 | 13 | 6 | 5 |
| Fax machines | 920 | 919 | 386 | 349 | 297 | 242 | 186 | 128 |
| Digital cameras | (NA) | (NA) | 1,825 | 1,972 | 2,794 | 3,921 | 4,739 | 7,468 |

*Source: 2007 Statistical Abstract of the United States, U.S. Census Bureau*

1. Use the **corded telephones** sales (in millions of dollars) to complete the table below.

|  |  |  |
| --- | --- | --- |
| Year | **Years since 1990** | **Sales of Corded Phones****(in millions of dollars)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. Use technology to find the linear regression line. Identify the slope and *y*-intercept below. Round each number to the nearest hundredth.

(Slope) *a* = (*y*-intercept) *b* =

1. Identify the equation of the linear regression line. The equation is of the form $y=ax+b$.
2. Use the equation to estimate the sales in 1997.
3. Is the prediction in question (4) an interpolation or an extrapolation? Explain.
4. What is the value of the correlation coefficient *r*?

1. What does the value of *r* indicate about the strength and direction of the data?
2. What does *r* tell us about the use of corded phones since 1990? Explain.

A graph of the corded phone sales over time is shown below.



1. Draw a trend line on the graph above that you feel fits the data points.
2. Identify two points on your line.
3. Find the equation of your line.
4. Compare the line you just created to the linear regression line which you calculated in question (3) by answering the following questions:
5. Compare the *y*-intercepts. How close is your line’s *y*-intercept to the regression line’s

*y*-intercept?

1. Compare the slopes. How close is your line’s slope to the regression line’s slope?
2. Is your line to steep or too flat? Explain how you came to your conclusion.
3. Based on these answers, do you believe you drew a good line of fit? Explain.
4. Use the equation you created to determine the year when the sales of corded phones will drop to 100 million dollars? Is this interpolation or extrapolation?

Go back to the table on page 1 and select a different product. Complete the table below using the sales information for this product. Write the name of the product above the table.

 Product:

|  |  |  |
| --- | --- | --- |
| Year | **Years since 1990** | **Sales****(in millions of dollars)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. Draw a scatterplot of the sales of the product over time in the coordinate plane below. Label and scale the axes appropriately.



1. Draw a trend line on the graph above that you feel fits the data points.
2. Circle the word(s) that describe the correlation between the sales of the product and the years since 1990. Explain your choice.

 strong weak none

 positive negative

1. Identify two points on your line.
2. Find the equation of your line.
3. Predict the sales of this product in the year 2015.
4. If you are offered a job to be the head of a marking department that sells this product, would you accept it based on research you just did? Do you think your job at this company would be secure for a long time?
5. Use technology to find the equation of the linear regression line.
6. Calculate the correlation coefficient *r*. Does this value of *r* confirm your prediction in question (14)?
7. How does your line compare to the linear regression line which you found in question (16)?
8. Did you make a good trend line? Explain.