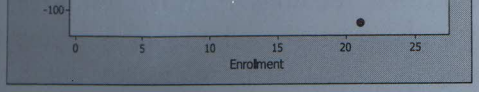
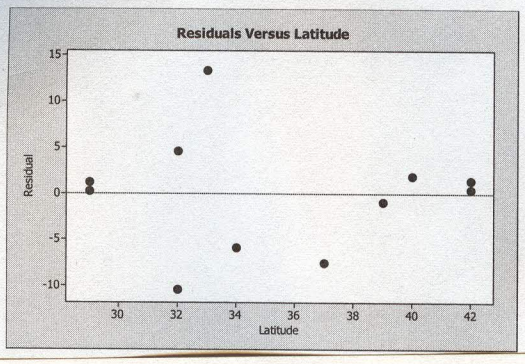


Quiz 3.2B

1. For each 1-degree increase in latitude, the predicted average July temperature decreases by 0.782 degrees. **2.** $\hat{y} = 106.5 - 0.782(42)$; $\hat{y} = 73.66$ degrees.

3. $y - \hat{y} = 74 - (-0.782(42) + 106.5) = 74 - 73.66 = 0.34$. The actual average July temperature in Detroit is 0.34 degrees higher that the average July temperature predicted by this linear model. **4.** See graph below. **5.** Since Phoenix's residual is large and positive, and Phoenix is at a relatively low latitude, the slope of the line would increase (that is, get closer to 0). **6.** 28% of the variability in average July temperature can be accounted for by the regression of average July temperature on latitude. **7.** Answers will vary and will depend on the appearance residual plot sketched in #4. Some students will say that there is no distinctive pattern in the residuals, so the linear model is a good fit. Others may argue that the variability is much larger for smaller values of latitude than for higher values of latitude and therefore this model is not appropriate.



Quiz 3.2C

1. (a) $\hat{y} = 105.74 + 0.769x$; $\hat{y}$ = predicted price, x = screen area. **(b)** The least-squares regression line is the line that minimizes the sum of the squared deviations between observed prices and prices predicted by the linear model. **(c)** 943 sq. in. is well beyond the range of screen areas used to produce the regression line, so this would be extrapolation. We cannot be sure that the relationship described by this line holds outside the range of available data. **(d)** $y - \hat{y} = 375 - (.769(437) + 105.74) = 375 - 441.79 = -66.79$. Since the residual is negative, the observed value is lower than the value predicted by the regression. This suggests that this particular television is a good buy! **2. (a)** $\hat{y} = -3.822 + 5.215x$; x = minutes of exercise, $\hat{y}$ = predicted number of floors climbed. **(b)** Since there is no distinctive pattern in the residuals, the linear model is a good fit. **(c)** On average, the predicted values will be about 2.35 floors from the actual values.