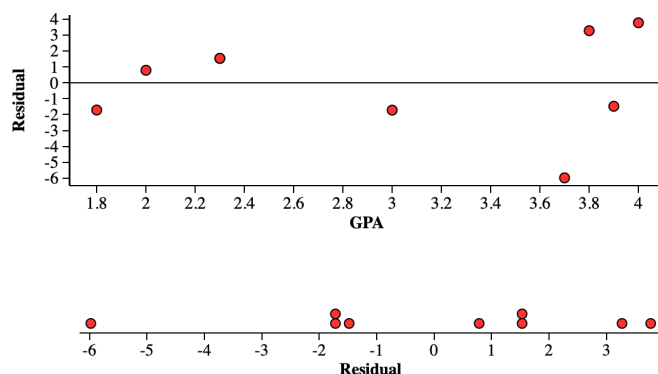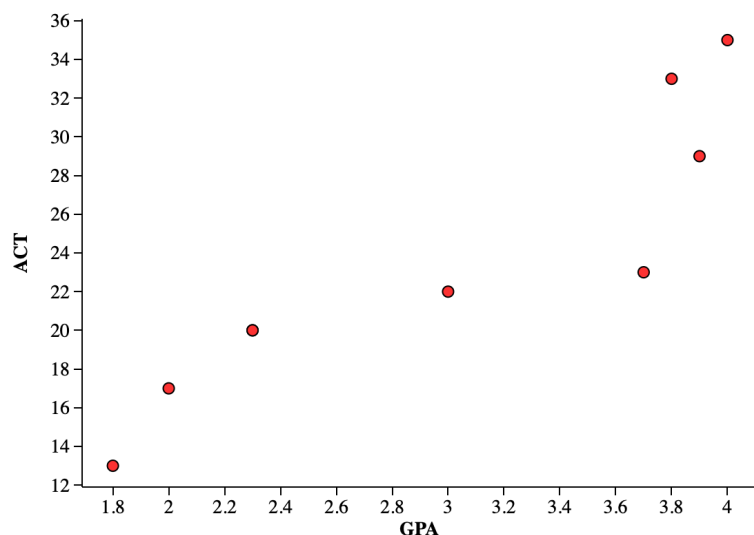## How does GPA relate to ACT score?

A teacher is wondering if there is a relationship between GPA and ACT score. She took a random sample of 9 out of her 101 students and recorded their GPA and ACT score. The data are below.

GPA	3.7	2.3	4.0	3.8	3.0	1.8	2.0	2.3	3.9
ACT	23	20	35	33	22	13	17	20	29

1. What relationship would you expect GPA and ACT score to have? Explain.

Here is the computer output as well as graphs of the data.

Predictor	Coef	SE Coef	T	P
Constant	1.201	0.0874	13.72	0
GPA	7.507	1.29	5.82	0.0006511

S = 3.252686   R-Sq = 82.8%   R-Sq(adj) = 76.5%

2. Find the LSRL for the data.

3. Do the data provide convincing evidence that there is a positive linear relationship between GPA and ACT?

STATE:
      Parameter: Statistic:

      H_0:

      H_a: α level:

PLAN: Name of procedure:

      (1) Linear:

      (2) Independent:

      (3) Normal:

      (4) Equal SD:

      (5) Random:

DO: General Formula: Picture:

          Specific Formula:

          Work:

                                                       Test statistic:

                                                         P-value:

CONCLUDE:

STOP

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Significance Test for Slope

Important ideas:

Check Your Understanding

Infants who cry easily may be more easily stimulated than others. This may be a sign of higher IQ. Child development researchers explored the relationship between the crying of infants 4 to 10 days old and their later IQ test scores. A snap of a rubber band on the sole of the foot caused the infants to cry. The researchers recorded the crying of 38 infants. They measured the crying intensity by the number of peaks in the most active 20 seconds. They later measured the children's IQ at age three years using the Stanford–Binet IQ test.

Here is computer output from a least-squares regression analysis of these data. Do these data provide convincing evidence at the α = 0.05 level of a positive linear relationship between count of crying peaks and IQ in the population of infants? Assume conditions have been met.

```
Regression Analysis: IQ versus Crycount
Predictor     Coef     SE Coef     T        P
Constant     91.268    8.934     10.22    0.000
Crycount     1.4929    0.4870     3.07    0.004
 S = 17.50   R-Sq = 20.7%   R-Sq(adj) = 18.5%
```

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