SCATTER PLOTS and CORRELATION - PRACTICE PROBLEMS - SOLUTIONS:
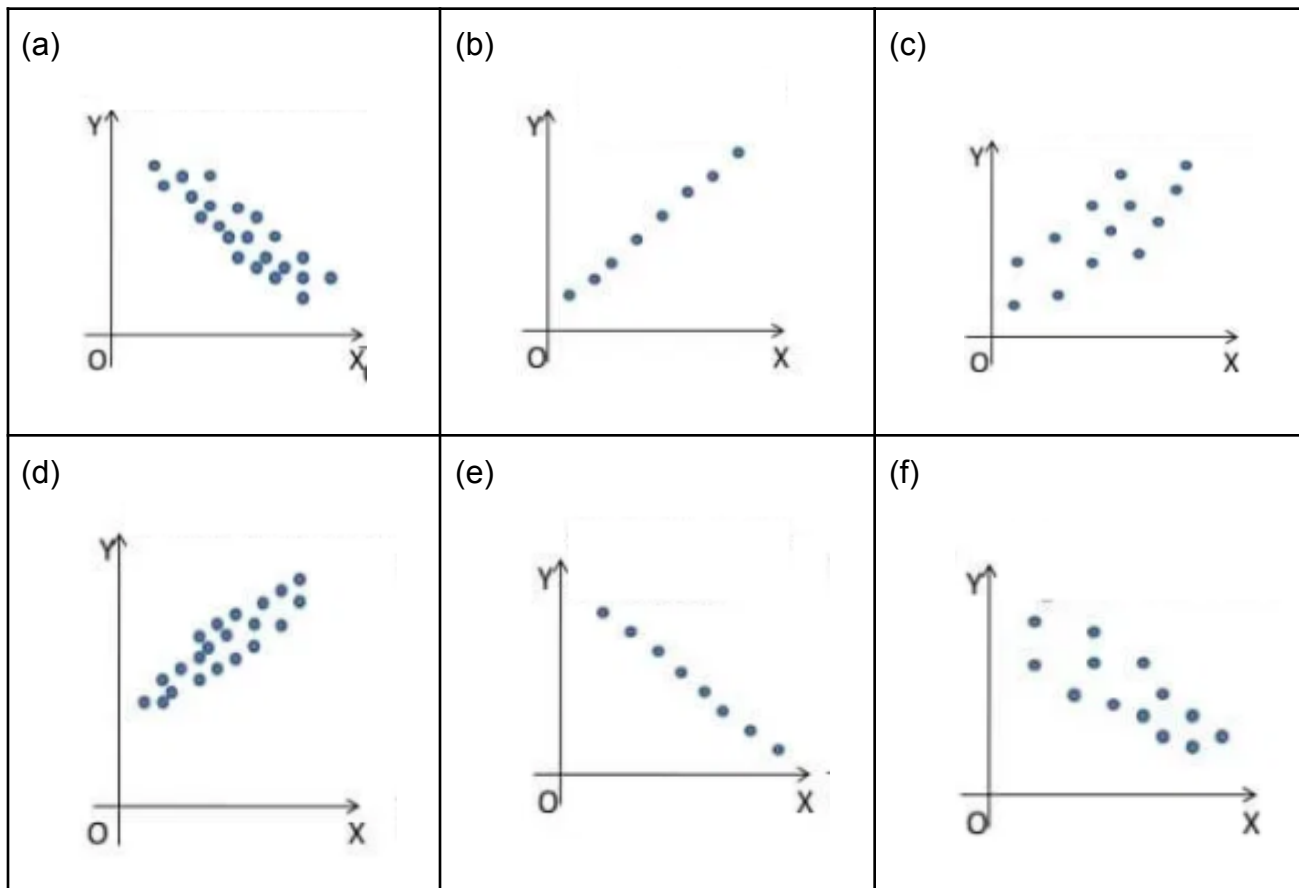
(1) Label each scatter plot has having:
   - *perfect*, *stong*, *weak* or *no* correlation
   - *positive* or *negative* correlation (unless it is "no correlation")

(a)	(b)	(c)
(d)	(e)	(f)

SOLUTION:
(a) Strong negative correlation
(b) Perfect positive correlation
(c) Weak positive correlation
(d) Strong positive correlation
(e) Perfect negative correlation
(f) Weak negative correlation

(2) For each scatter plot below, make up a scenario that fits the pattern shown - a pair of variables that when graphed together would look like the graph.
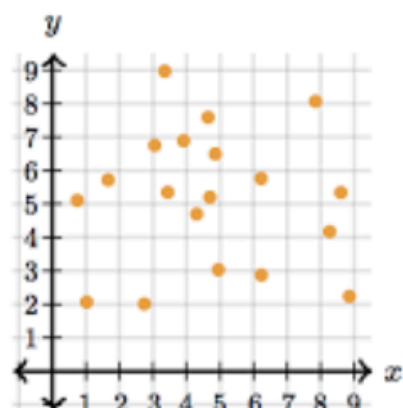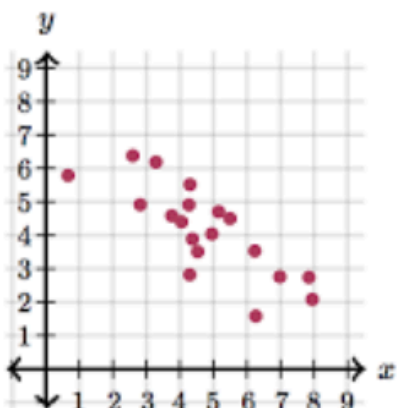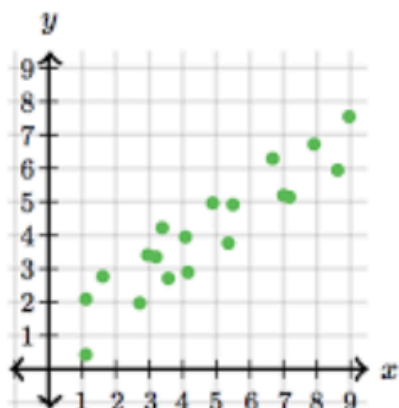
SOLUTION

Many possible answers - they just have to fit with the following:
- 1st graph (green): *positive* **correlation, so as one quantity goes** *up*, **the other also goes** *up*
- 2nd graph (pink): *negative* **correlation, so as one quantity goes** *up*, **other goes** *down*
- 3rd graph (orange): *no* **correlation, so the two quantities are unrelated, no association**

I'll respond to your submissions on Schoology to give you individual feedback on the scenarios you came up with for each.

(3) The table shows the amount of time different students studied for a test and their score.
    (a) Construct a scatter plot of the data.
    (b) Interpret the scatter plot based on the distribution of the data points (the shape and pattern, if any, made by the plotted points). Is there any correlation? Is it positive or negative, strong or weak, linear or nonlinear?
    (c) Are there any outliers? If so, which point(s)?

SOLUTION
(a) See graph below. Points plotted in red. Line of best fit drawn afterwards, in blue.
(b) There is a positive, strong correlation between time spent studying and test score, except for the two outliers. In general, the more you studied, the better the score.
(c) Yes, there are two outliers, circled in blue. The points are (5, 89) and (25, 55) The first is a student who didn't need to study much and still did well … maybe he/she paid good attention in class and did the homework, so he/she only needed to study 5 minutes to get an 89. The second person studied a fair amount (25 minutes), but still did poorly (only got a 55). Maybe they didn't pay attention in class or were absent and missed class and didn't do the make up work, so studying didn't help them much.

Data:

Time (mins.)	5	10	15	20	25	30	35	40	45	50
Test Score	89	65	68	67	55	79	85	89	92	98