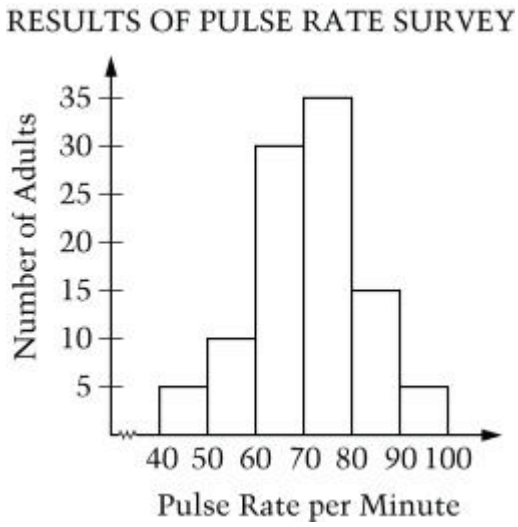
Figure A1

The Most Difficult "Hard" Problems from the 2005 NAEP

3. Roxanne plans to enlarge her photograph, which is 4 inches by 6 inches. Which of the following enlargements maintains the same proportions as the original photograph? Justify your answer.

   5 inches by 7 inches 5 inches by $7\frac{1}{2}$ inches

14. In a certain restaurant a whole pie has been sliced into 8 equal wedges. Only 2 slices of the pie remain. Three people would each like an equal portion from the remaining slices of pie. What fraction of the original pie should each person receive?

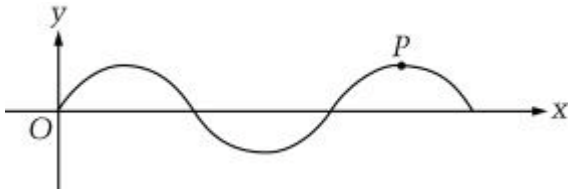


15. The pulse rate per minute of a group of 100 adults is displayed in the histogram above. For example, 5 adults have a pulse rate from 40-49 inclusive. Based on these data, how many individuals from a comparable group of 40 adults would be expected to have a pulse rate of 80 or above?

16. A clock manufacturer has found that the amount of time their clocks gain or lose per week is normally distributed with a mean of 0 minutes and a standard deviation of 0.5 minute, as shown below.

    In a random sample of 1,500 of their clocks, which of the following is closest to the expected number of clocks that would gain or lose more than 1 minute per week?

A) 15 B) 30 C) 50 D) 70 E) 90



17. The graph of $f(x) = \sin x$ is shown above. Which of the following is the x coordinate of point P ?

A) $\frac{\pi}{2}$ B) π C) $\frac{3\pi}{2}$ D) 2π E) $\frac{5\pi}{2}$

Figure A2
A Sample Question from the PISA Test

THE BEST CAR

A car magazine uses a rating system to evaluate new cars, and gives the award of "The Car of the Year" to the car with the highest total score. Five new cars are being evaluated, and their ratings are shown in the table.

Car	Safety Features (S)	Fuel Efficiency (F)	External Appearance (E)	Internal Fittings (T)
Ca	3	1	2	3
M2	2	2	2	2
Sp	3	1	3	2
N1	1	3	3	3
KK	3	2	3	2

The ratings are interpreted as follows:

3 points = Excellent
2 points = Good
1 point = Fair

Question 1: THE BEST CAR

M704Q01

To calculate the total score for a car, the car magazine uses the following rule, which is a weighted sum of the individual score points:

$$\text{Total Score} = (3 \times S) + F + E + T$$

Calculate the total score for Car "Ca". Write your answer in the space below.

Total score for "Ca": .....

Question 2: THE BEST CAR

M704Q02

The manufacturer of car "Ca" thought the rule for the total score was unfair.

Write down a rule for calculating the total score so that Car "Ca" will be the winner.

Your rule should include all four of the variables, and you should write down your rule by filling in positive numbers in the four spaces in the equation below.

Total score = ...× S + ...× F + ...× E + ...× T.

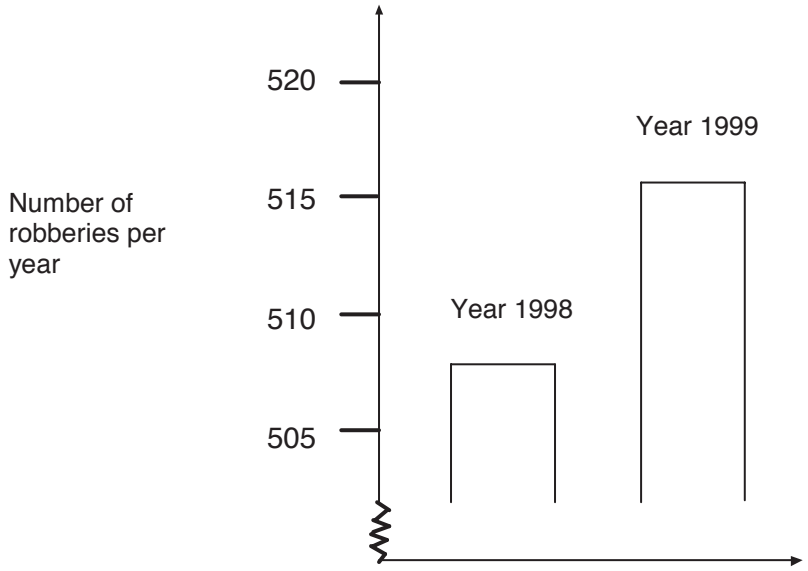
Figure A3
A Sample Question Common to PISA and TIMSS

Question 1: ROBBERIES

M179Q01- 01 02 03 04 11 12

A TV reporter showed this graph and said:

"The graph shows that there is a huge increase in the number of robberies from 1998 to 1999."



Do you consider the reporter's statement to be a reasonable interpretation of the graph? Give an explanation to support your answer.