

Practice Set 7 Understanding Probability

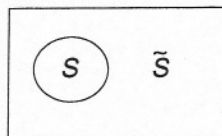
- I. Darin collected the following information concerning customer age and making a sale. Please complete this chart.

Customer Age and Making A Sale			
Customer Age	Less than or equal to 20	Over 20	Totals
Making A Sale			
No	16	8	24
Yes	<u>24</u>	<u>12</u>	<u>36</u>
Totals	40	20	60

- II. Solve the following problems using the data from question I. Be sure to use a formula and draw a Venn diagram.

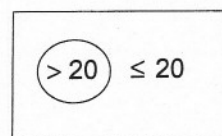
- A. The probability of making a sale.

$$P(S) = \frac{S}{n} = \frac{36}{60} = .6 \rightarrow 60\%$$



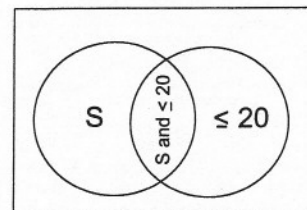
- B. The probability of a customer being over 20.

$$P(> 20) = \frac{>20}{n} = \frac{20}{60} = .333 \rightarrow 33.3\%$$



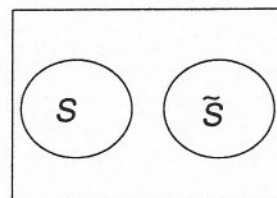
- C. The probability of making a sale or a customer being less than or equal to 20.

$$\begin{aligned} P(S \text{ or } \leq 20) &= P(S) + P(\leq 20) - P(S \text{ and } \leq 20) \\ &= P\left(\frac{36}{60}\right) + P\left(\frac{40}{60}\right) - P\left(\frac{24}{60}\right) \\ &= \frac{52}{60} \\ &= .867 \\ &= 86.7\% \end{aligned}$$



- D. The probability of making a sale or not making a sale.

$$\begin{aligned} P(S \text{ or } \bar{S}) &= P(S) + P(\bar{S}) \\ &= P\left(\frac{36}{60}\right) + P\left(\frac{24}{60}\right) \\ &= \frac{60}{60} \\ &= 1.00 \\ &= 100\% \end{aligned}$$



- E. State the addition rule used to answer question C. What condition is necessary to apply this rule?

1. C was solved with the general rule of addition.
2. It is used when events are not mutually exclusive. The events intersect.

- F. State the addition rule used to answer question D. What condition is necessary to apply this rule?

1. D was solved with the special rule for addition.
2. It is used when events are mutually exclusive. The events do not intersect.