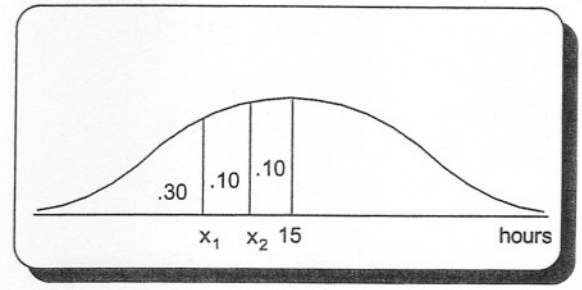
B. Calculate the fourth decile.

$.20 = \rightarrow z = .52$ | $.10 = \rightarrow z = .25$

$\mu \pm z\sigma$
$15 - .52(3)$
$15 - 1.56$
13.44

$\mu \pm z\sigma$
$15 - .25(3)$
$15 - .75$
14.25

$13.44 \leftrightarrow 14.25$



III. Answer the following questions based upon this study of money spent on souvenirs at a virtual reality theme park.

Age \ Money spent on souvenirs	Under $5	$5 and over	Totals
Under 22	5	15	20
22 and older	20	20	40
Totals	25	35	60

A. Use a formula to calculate the P(Age < 22 or Age ≥ 22)

$$P(<22 \text{ or } \geq 22) = P(<22) + P(\geq 22)$$
$$= P(\tfrac{20}{60}) + P(\tfrac{40}{60}) = \tfrac{60}{60} = 1.00 \rightarrow 100\%$$

B. The events in question A are mutually exclusive and therefore, the special rule for addition is applicable.

C. Use a formula to calculate the probability of someone being at least 22 years old and spending $5 and over.

$$P(\geq 22 \text{ and } \geq \$5) = P(\geq 22)\, P(\geq \$5 \mid \geq 22) = \tfrac{40}{60} \times \tfrac{20}{40} = \tfrac{800}{2{,}400} = .333 = 33.3\%$$

D. Question C required the general rule for multiplication because the events are dependent.

E. Use Bayes' theorem to calculate the probability of someone at least 22 years old spending $5 or more.

$$P(\geq \$5 \mid \geq 22) = \frac{P(\geq \$5 \text{ and } \geq 22)}{P(\geq 22)} = \frac{P(\geq \$5) \times P(\geq 22 \mid \geq \$5)}{P(\geq \$5) \times P(\geq 22 \mid \geq \$5) + P(<\$5) \times P(\geq 22 \mid <\$5)}$$
$$= \frac{\frac{35}{60} \times \frac{20}{35}}{\frac{35}{60} \times \frac{20}{35} + \frac{25}{60} \times \frac{20}{25}} = \frac{\frac{700}{2{,}100}}{\frac{700}{2{,}100} + \frac{500}{1{,}500}} = \frac{\frac{1}{3}}{\frac{1}{3} + \frac{1}{3}} = \frac{\frac{1}{3}}{\frac{2}{3}} = .5 \rightarrow 50\%$$

F. Using the above chart, calculate the probability of someone at least 22 years old spending less than $5.

$$P(<\$5 \mid \geq 22) = \tfrac{20}{40} = .5 \rightarrow 50\%$$

G. Why does your answer to question F make sense?

This answer makes sense because the answers to questions E and F are complements.

IV. Use a formula to calculate the probability of tossing a coin 3 times and getting exactly 3 heads. What is the probability of a head coming up on the fourth toss?

A. $P(H \text{ and } H \text{ and } H) = P(H)P(H)P(H) = .5 \times .5 \times .5 = .125$

B. $P(H) = 50\%$

V. Four customers have three branches and you will visit the manager and assistant manager at each branch. How many managers and assistant managers will you visit?

According to the counting rule: $MNO = 4 \times 3 \times 2 = 24$