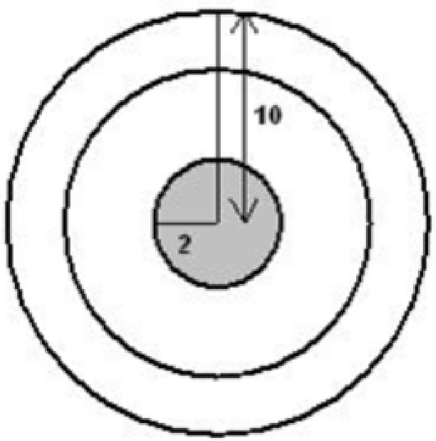
18



$A_{big} = \pi(10)^2 = 100\pi$

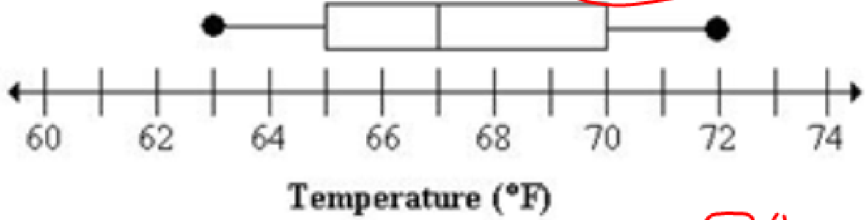
$A_{small} = \pi(2)^2 = 4\pi$

Prob-hit

$\frac{4\pi}{100\pi} = \frac{1}{25} = .04 = 4\%$

$96\% = .96 = \frac{24}{25}$

20. The following box-and-whisker plot shows the average temperatures of various cities yesterday at noon. What is the interquartile range for this data?



1st Q = 65
3rd Q = 70

$70 - 65$

5

6. Saul takes a fair coin out of his pocket and flips it 2,500 times. He records 1,277 as the number of times the coin landed heads up. If the theoretical probability of this experiment is 0.5000, what is the difference between his experimental probability and the theoretical probability of landing on heads when flipping the coin?

$$\frac{\text{exp}}{\frac{1277}{2500}} - \frac{\text{theory}}{.5}$$

A. 0.0108 B. 0.4892

C. ~~0.5000~~ D. 0.5108

KEY CONCEPT — Fundamental Counting Principle

Words If event M can occur in m ways and is followed by event N that can occur in n ways, then event M followed by event N can occur in $m \cdot n$ ways.

Example If event M can occur in 2 ways and event N can occur in 3 ways, then M followed by N can occur in $2 \cdot 3$ or 6 ways.

This rule can be extended to any number of events.

KEY CONCEPT — Probability of Two Independent Events

If two events, A and B, are independent, then the probability of both events occurring is $P(A \text{ and } B) = P(A) \cdot P(B)$.

and

This formula can be applied to any number of independent events.

KEY CONCEPT — Probability of Mutually Exclusive Events

Words If two events, A and B, are mutually exclusive, then the probability that A or B occurs is the sum of their probabilities.

Symbols $P(A \text{ or } B) = P(A) + P(B)$

OR

probability of drawing a 2 or an ace? Since a card cannot be both a 2 *and* an ace, these are called **mutually exclusive events**. That is, the two events cannot occur at the same time. The probability of drawing a 2 or an ace is found by adding their individual probabilities.

1. How many 6-letter codes can be formed using the letters U, V, W, X, Y, and Z, allowing repetition?

$$\underline{6} \times \underline{6} \times \underline{6} \times \underline{6} \times \underline{6} \times \underline{6}$$

$$6^6 = 46,656$$

2. How many seven-digit telephone numbers can be made using the digits 0-9, without repetition?

$$\underline{10} \times \underline{9} \times \underline{8} \times \underline{7} \times \underline{6} \times \underline{5} \times \underline{4}$$

$$604,800$$

10-digit tel. #

$$10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 10!$$ factorial

3. Brian is playing a game with his friends. When you roll doubles (both six-sided dice land on the same number) you get another turn. In order to win the game, you must roll doubles 5 times in a row. What is the probability that Brian will be able to do this and win? Remember, there are 36 possible outcomes when you roll two dice.

$\frac{6}{36}$ 1st 2nd

$$\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = \frac{1}{7776}$$

4. Marietta has a nail gun that malfunctions 22% of the time. If she uses the nail gun 70 times in the next 2 weeks, how many times can she expect it to malfunction? Round your answer to the nearest whole number.

$.22 \times 70 = 15.4$

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5. The probability of seeing a whale during January, February, or March while on a boat trip in Baja, Mexico is 0.891. Of the 450 boat trips that will sail during January, February, or March, how many are NOT expected to see a whale? Round your answer to the nearest whole number.

$450 \times .891 = 400.95$ OR $1 - .891 = .109$

$450 - 401 = 49$

$450 \cdot .109 = 49.05$

49