Warm-Up

Ms. Holtmeyer is writing a quiz!! She needs to have 5 questions from section 1 which has a possible 15 questions, 4 questions from section 2 (possible 10) and 2 questions from section 3 (possible 5). How many different ways can she write her quiz?

$$\frac{_{15}C_5}{3003} \qquad \frac{_{10}C_4}{210} \qquad \frac{_5C_2}{10}$$

$$6,306,300$$

8.7

Probability

SAMPLE SPACE

The set of all possible outcomes for an experiment is called the sample space.

So what was the sample space for our warm up?

6,306,300

PROBABILITY

The probability for a selected event is the likelihood of it occurring.

For event E, the probability of it occurring is given by:

$$P(E) = \frac{\# \ of \ ways \ E \ can \ occur}{Sample \ Space}$$

$$0 \le P \le 1$$

Find the probability of the following event occurring

Rolling a 7 with two six-sided dice.

$$\frac{6}{36} = \left(\frac{1}{6}\right)$$

1	6
6	1
2	5
5	2
3	4
4	3

Find the probability of the following event occurring

Rolling a 2 with two six-sided dice.

$$\frac{1}{36}$$

Find the probability of the following event occurring

Picking a card from a full deck and getting an ace.

$$\frac{4}{52} = \frac{1}{13}$$

Find the probability of the following event occurring

Picking a card from a full deck and NOT gettingan ace.

$$\frac{48}{52} = \frac{12}{13}$$

Find the probability of the following event occurring

Picking a card from a full deck and getting a red card.

$$\frac{26}{52} = \frac{1}{2}$$

Find the probability of the following event occurring

Picking a card from a full deck and NOT getting a red card.

$$\frac{1}{2}$$

COMPLEMENTS

The complement of event E, called E', is all of the ways that E can NOT happen.

$$P(E') = 1 - P(E)$$

Examples:

$$P(E) = .65456$$

$$P(E') = \quad 1 - .65456$$

$$P(E) = \frac{32}{76}$$

$$P(E') = \quad \frac{76}{76} - \frac{32}{76} =$$

Find the probability of the following event occurring

Picking two cards from a full deck, without replacement and getting two jacks.

$$\frac{4}{52} \cdot \frac{3}{51} = \frac{1}{221}$$

Find the probability of the following event occurring

Picking two cards from a full deck, without replacement and NOT getting two jacks.

$$1 - \frac{1}{221} = \frac{220}{221}$$

Find the probability of the following event occurring

Picking five cards from a full deck, without replacement and getting four of a kind.

Find the probability of the following event occurring

Picking five cards from a full deck, without replacement and NOT getting four of a kind.

The Probability of the Union of Two Events

If and A and B are events in the same sample space, then the probability of A **or** B occurring is given by:

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

"or"   girls   fresh   "and"

14 +

Girls 14   ? 11   Juniors 15

Find the probability of the following event occurring

Picking a card from a deck that is black OR less than or equal to 4. (Aces are low)

$$\frac{26}{52} + \frac{16}{52} - \frac{8}{52} = \frac{34}{52}$$

Ace
2
3
4

Clubs/
Spades

1-15, pick divisible by 3 _and_ odd

3
~~6~~
9
~~12~~
15

$$\frac{3}{15} = \boxed{\frac{1}{5}}$$

Find the probability of the following event occurring

Picking a card from a deck that is a club OR a face card.

$$\frac{13}{52} + \frac{12}{52} - \frac{3}{52} = \frac{22}{52} = \boxed{\frac{11}{26}}$$

Homework 8.7

page 620 #1 - 35 odd, 43 - 51 odd