Advanced Math
Review 13.3 and 13.4

Name KEY

13.3

What formulas are used...

To find probability? $P(S) = \frac{S}{S+F}$ **To find odds?** $\frac{P(S)}{P(F)}$

A box contains 3 tennis balls, 7 softballs and 11 baseballs. One ball is chosen at random. Find each probability.

1) *P(softball)* $\frac{7}{21} = \boxed{\frac{1}{3}}$

2) *P(not a baseball)* $\boxed{\frac{10}{21}}$

3) *P(golf ball)* $\boxed{0}$

4) At Dunder Mifflin, of 11 salespeople, there are 7 women and 4 men. If two people are randomly called on the phone, find the probability that one person is a male and the other is a female.

$$\frac{C(7,1)\cdot C(4,1)}{C(11,2)} = \boxed{\frac{28}{55}}$$

Using a standard deck of 52 cards, find each probability. (Assume Ace is a 1).

5) P(face card) $\frac{12}{52} = \boxed{\frac{3}{13}}$

6) P(3 or more) $1 - P(\text{Ace}) + P(2)$

$1 - \left[\frac{8}{52}\right] = \boxed{\frac{11}{13}}$

7) P(not a face card) $\boxed{\frac{10}{13}}$

8) The odds of passing Miss Bryniczka's math class second semester are 6 : 4.

a) What is the probability of passing this semester? $\frac{6}{10} = \boxed{\frac{3}{5}}$

b) What is the probability of not passing this semester? $\boxed{\frac{2}{5}}$

$\frac{S}{F} = \frac{6}{4}$ $\frac{S}{S+F} = \frac{6}{6+4}$

9) The probability of being accepted to attend a state university in Illinois is $\frac{4}{5}$. What are the odds of being accepted to a state university in Illinois? $\frac{S}{S+F} = \frac{4}{4+1}$ $\boxed{4:1}$

10) In a bag of Skittles, there are 4 yellow, 3 red and 7 green and 6 orange. If you want to eat 5 Skittles, what is the probability of...

a) P(5 green) $\frac{C(7,5)}{C(20,5)} = \frac{21}{15,504} = \boxed{\frac{7}{5,168}}$

b) P(2 yellow, 1 red and 2 orange) $\frac{C(4,2)\cdot C(3,1)\cdot C(6,2)}{C(20,5)} = \frac{6\cdot 3\cdot 15}{15,504} = \boxed{\frac{45}{2584}}$

c) P(5 red) = 0

d) P(at least 4 orange)

$P(4 \text{ orange}) + P(5)$

$\frac{C(6,4)\cdot C(14,1)}{C(20,5)} + \frac{C(6,5)\cdot}{C(20,5)} = \frac{210}{15,504} + \frac{6}{15,504} = \boxed{\frac{9}{64}}$

13.4

What are the formulas for the following events...

Two independent events?

$P(A \text{ and } B) = P(A) \cdot P(B)$

Two dependent events?

$P(A \text{ and } B) = P(A) \cdot P(B \text{ following } A)$

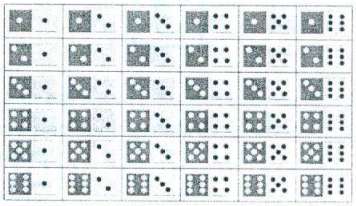
Mutually Exclusive events?

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

Mutually Inclusive events?

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

State whether each pair of events is independent or dependent.
Then find the probability when two dice are rolled. (see diagram to right)



11) the probability that the both show 3

independent $\frac{1}{36}$

12) the probability that neither show 3

$1 - \frac{11}{36} = \frac{25}{36}$

13) the probability that both show the same number

$\frac{6}{36} = \frac{1}{6}$

14) the probability that first die is a 3 and the second die is any other number

$\frac{5}{36}$

A standard deck of cards contains 4 suits and 13 cards of each.
What is the probability of drawing...

15) a face card, replacing it, and then an eight

$\frac{12}{52} \cdot \frac{4}{52} = \boxed{\frac{3}{169}}$ independent

16) a face card, not replacing it, and then an eight

dependent $\frac{12}{52} \cdot \frac{4}{51} = \boxed{\frac{4}{221}}$

16) There are 7 bags of Doritos and 11 bags of Cheetos in a box. Without looking, Ms. Bryniczka chooses a bag for herself and for a friend. What is the probability of choosing 2 Cheetos?

$\frac{C(11,2)}{C(18,2)} = \boxed{\frac{55}{153}}$

State whether each pair of events is mutually exclusive or mutually inclusive. Then determine each probability.

13) the probability of choosing a penny or a quarter from a stack of 20 pennies, 25 nickels and 19 quarters

exclusive $P(\text{penny}) + P(\text{quarter})$

$\frac{20}{64} + \frac{19}{64} = \boxed{\frac{39}{64}}$

14) the probability of selecting an ace or a black card from a standard deck of 52 cards

inclusive $P(\text{ace}) + P(\text{black}) - P(\text{black and Ace})$

$\frac{4}{52} + \frac{1}{2} - \frac{2}{52} = \boxed{\frac{7}{13}}$

15) the probability that if a card is drawn from a standard deck it is a red or a face card

inclusive $P(\text{red}) + P(\text{face}) - P(\text{red and face})$

$\frac{1}{2} + \frac{12}{52} - \frac{6}{52} = \boxed{\frac{8}{13}}$