Algebra 2
Review Sheet 11.1-11.3

Name _____
Hour _____ Date _____

Show the set up for **ALL** problems!

For problems 1 – 3, find the probability of each event as a simplified fraction **and** a percent to the nearest tenth of a percent.

1. A bag contains 3 white, 2 yellow, 1 green, and 4 blue marbles. Find each probability.
   A. $P(\text{yellow})$ 1a. _____
   B. $P(\text{white or green})$ 1b. _____

2. When a number cube is rolled, a number less than 5 appears. 2. _____

3. A card is chosen at random from a standard deck is a jack, queen, king, or ace. 3. _____

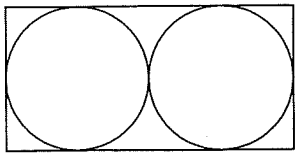
For problems 4-5, find the number of possible passwords for each of the following conditions:

4. 2 letters followed by 3 digits (with no letters or digits excluded) 4. _____

5. 3 letters followed by 3 digits, with only vowels and even digits allowed (consider y a consonant) 5. _____

6. For a given telephone area code, how many 7-digit numbers are possible if the first digit cannot be a zero? 6. _____

7. If one point is randomly selected from the points inside the rectangle shown below, find the probability, to the nearest tenth of a percent, that the point is not in a circle. 7. _____



For problems 8-11, evaluate each expression. (**Show all work. Only use your calculator to multiply or divide.)**

8. $\dfrac{10!}{4! \times 6!}$ 8. _____

9. ${}_9P_3$ 9. _____

10. ${}_7C_3$ 10. _____

11. $\dfrac{(7-3)! \times 3!}{2! \times 0!}$ 11. _____

12. Eight teams enter a tournament. How many different arrangements of first-, second-, and third-place winners are possible? 12. _____

13. At a deli, a sub sandwich can be ordered with any of 7 different condiments. In how many different ways can a sandwich with exactly 3 condiments be ordered? 13. _____

14. Find the number of ways in which a committee can be selected with 4 people from a group of 7 people. 14. _____

15. The 8 winning entries in a school art contest are to be displayed in a row. In how many different orders can the entries be displayed? 15. _____

16. How many ways can 4 DVDs be borrowed from a collection of 25 DVDs? 16. _____

17. There are 15 students participating in a spelling bee. How many ways can the students be chosen to go first, second, third, and fourth? 17. _____

18. How many ways can 10 horses line up for a race? 18. _____

19. Each of the digits 1 to 9 is written on a card. The cards are placed in a sack, and one is drawn at random. Tell whether the events are inclusive or mutually exclusive. Then find the probability of each pair of events.

a. digit is odd or a multiple of 3 19a. _____

b. digit is less than 2 or is greater than 8 19b. _____

20. A red number cube and a green number cube are rolled. Find the probability of each event.

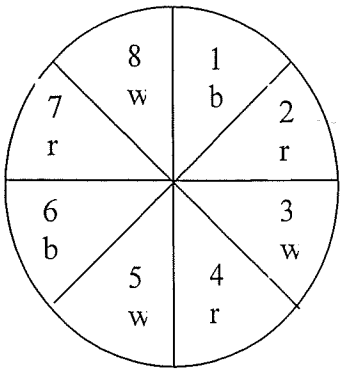
a. the red cube is greater than 1, and the green cube is less than or equal to 4 20a. _____

b. the red cube is even, and the green cube is a 5 20b. _____

21. The spinner shown is spun once. Find the probability of each event.

a. the number is greater than 3 or red _____

b. The number has a factor of 2 or is not white. _____



22. A card is drawn from a deck of cards numbered one through twenty. The card is NOT replaced and another card is drawn. Find the probability that two prime numbers are drawn in a row. 22. _____

23. A grab bag contains 18 football cards and 6 basketball cards. An experiment consists of taking one card out of the bag, replacing it and then selecting another card. Determine whether the events are independent or dependent. What is the probability of selecting a football card and then a basketball card? 23. _____ _____

24. There are 6 blue marbles, 7 black marbles, 4 orange marbles, and 3 green marbles in a bag. One marble is chosen from the bag. Find the probability - P(an orange marble or a blue marble or a green marble). 24. _____

25. A bag contains 6 red chips, 9 white chips, and 5 blue chips. One chip at a time is selected and not replaced. Find the probability of each event.

a. the first chip is blue and the second chip is not blue 25a. _____

b. the first chip is white and the second is blue and the third chip is red. 25b._____

eye

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Show the set up for **ALL** problems!

For problems 1 – 3, find the probability of each event as a simplified fraction **and** a percent to the nearest tenth of a percent.

1. A bag contains 3 white, 2 yellow, 1 green, and 4 blue marbles. Find each probability.

   A. $P(\text{yellow})$ 1a. $2/10 = 1/5$

   B. $P(\text{white or green})$ 1b. $4/10 = 2/5$

2. When a number cube is rolled, a number less than 5 appears. 2. $4/6 = 2/3$

   1, 2, 3, 4

3. A card is chosen at random from a standard deck is a jack, queen, king, or ace. 3. $16/52 = 4/13$

For problems 4-5, find the number of possible passwords for each of the following conditions:

4. 2 letters followed by 3 digits (with no letters or digits excluded) 4. 676,000

   26 · 26 · 10 · 10 · 10

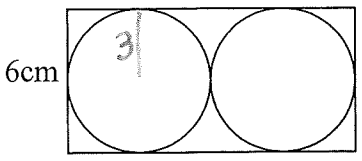
5. 3 letters followed by 3 digits, with only vowels and even digits allowed (consider y a consonant) 5. 15,625

   5 letter · 5 letter · 5 digit · 5 digit · 5 digit · 5 digit

6. For a given telephone area code, how many 7-digit numbers are possible if the first digit cannot be a zero? 6. 9,000,000

   9 · 10 · 10 · 10 · 10 · 10 · 10

7. If one point is randomly selected from the points inside the rectangle shown below, find the probability, to the nearest tenth of a percent, that the point is not in a circle. 7. $\frac{15.48}{72} = 21.5\%$



πr^2
$\pi \cdot 3^2$
$2(\pi \cdot 9)$
$[18\pi$ area of the two circles$] = 56.52$
$[6 \cdot 12 = 72$ area of the square

$72 - 56.52$

For problems 8-11, evaluate each expression. (**Show all work. Only use your calculator to multiply or divide.)**

8. $\dfrac{10!}{4! \times 6!}$ 8. _____

9. ${}_9P_3$ 9. _____

10. ${}_7C_3$ 10. _____

11. $\dfrac{(7-3)! \times 3!}{2! \times 0!}$ 11. _____

12. Eight teams enter a tournament. How many different arrangements of first-, second-, and third-place winners are possible? 12. 336

order matters $_8P_3$ $\frac{8!}{5!} = 8 \cdot 7 \cdot 6$

13. At a deli, a sub sandwich can be ordered with any of 7 different condiments. In how many different ways can a sandwich with exactly 3 condiments be ordered? 13. 35

order doesn't matter $\frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{3 \cdot 2 \cdot 1 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$ $_7C_3$ $\frac{7!}{3!4!}$

14. Find the number of ways in which a committee can be selected with 4 people from a group of 7 people. 14. 35

order doesn't matter $\frac{7!}{4!3!} =$

15. The 8 winning entries in a school art contest are to be displayed in a row. In how many different orders can the entries be displayed? 15. 40,320

$8!$

16. How many ways can 4 DVDs be borrowed from a collection of 25 DVDs? 16. 12,650

$_{25}C_4$ $\frac{25!}{4!\,21!} = \frac{25 \cdot 24 \cdot 23 \cdot 22}{4 \cdot 3 \cdot 2 \cdot 1}$

17. There are 15 students participating in a spelling bee. How many ways can the students be chosen to go first, second, third, and fourth? 17. 32,760

$_{15}P_4$ $\frac{15!}{11!} = 15 \cdot 14 \cdot 13 \cdot 12$ $\frac{15!}{11!}$

18. How many ways can 10 horses line up for a race? 18. 3,628,800

$10!$

19. Each of the digits 1 to 9 is written on a card. The cards are placed in a sack, and one is drawn at random. Tell whether the events are inclusive or mutually exclusive. Then find the probability of each pair of events.

a. digit is odd or a multiple of 3 inclusive 19a. 2/3

1,2,3,4,5,6 7,8,9

$P(\text{odd}) + P(\text{multiple 3}) - P(\text{odd \& mult 3})$

$5/9 + 3/9 - 2/9 = 6/9 = 2/3$

b. digit is less than 2 or is greater than 8 19b. 2/9

mutually exclusive

$P(<2) + P(>8)$ $\frac{1}{9} + \frac{1}{9}$

20. A red number cube and a green number cube are rolled. Find the probability of each event.

a. the red cube is greater than 1, and the green cube is less than or equal to 4 20a. 5/9

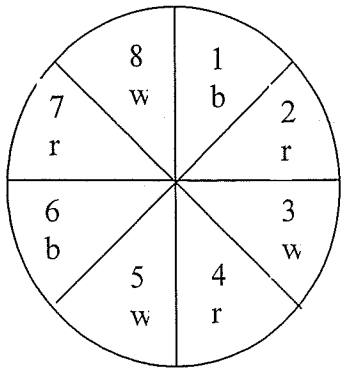
independent events

$\frac{5}{6} \cdot \frac{4}{6} = \frac{20}{36}$

b. the red cube is even, and the green cube is a 5 20b. 1/12

$\frac{3}{6} \cdot \frac{1}{6} = \frac{3}{36} = 1/12$

21. The spinner shown is spun once. Find the probability of each event.



a. the number is greater than 3 or red

inclusive

$P(>3) + P(\text{red}) - P(>3 \text{ and red})$

$5/8 + 3/8 - 2/8 = 6/8 = 3/4$

b. The number has a factor of 2 or is not white.

$P(\text{factor 2}) + P(\text{not white})$

$\frac{4}{8} + \frac{5}{8} - \frac{3}{8} = 6/8 = 3/4$

1 – 20

2, 3, 5, 7, 11, 13, 17, 19

22. A card is drawn from a deck of cards numbered one through twenty. The card is NOT replaced and another card is drawn. Find the probability that two prime numbers are drawn in a row. 22. 14/95

$\frac{28}{520} \cdot \frac{7}{19} = \frac{14}{95}$

23. A grab bag contains 18 football cards and 6 basketball cards. An experiment consists of taking one card out of the bag, replacing it and then selecting another card. Determine whether the events are independent or dependent. What is the probability of selecting a football card and then a basketball card? 23. 3/16

$\frac{18}{24} \cdot \frac{6}{24}$ $\quad$ $\frac{3}{4} \cdot \frac{6}{24}$

24. There are 6 blue marbles, 7 black marbles, 4 orange marbles, and 3 green marbles in a bag. One marble is chosen from the bag. Find the probability - P(an orange marble or a blue marble or a green marble). 24. 13/20

$\frac{4}{20} + \frac{6}{20} + \frac{3}{20} = \frac{13}{20}$

25. A bag contains 6 red chips, 9 white chips, and 5 blue chips. One chip at a time is selected and not replaced. Find the probability of each event.

a. the first chip is blue and the second chip is not blue 25a. _____

$\frac{5}{20} + \frac{15}{19}$

b. the first chip is white and the second is blue and the third chip is red. 25b. _____