Algebra 2 – Year 2 Name: _____

Review Sheet #1: Lessons 11.1-11.2, 11.8 Date: _____ Hour: _____

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.

1. A box contains 6 green, 5 yellow, and 3 purple balls. Find the probability of drawing a green ball in a single random draw.

1. _____ _____
FRACTION PERCENT

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

2. _____ _____
FRACTION PERCENT

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

3. _____ _____
FRACTION PERCENT

4. Find the number of possible passwords for 3 letters followed by 3 digits, with only consonants (consider "y" a consonant) and odd digits allowed.

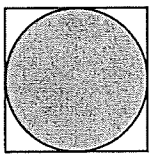
4. _____

5. An ice cream shop has 21 flavors of ice cream, 7 toppings, and 8 mix-ins. How many different sundaes can the shop make?

5. _____

6. If one point is randomly selected from the points inside the rectangle shown below, find the probability that the point is in the circle. (Remember: Area of a circle = πr^2)

6. _____



12cm

For problems 7-15, evaluate each expression. **(Show all work - Only use your calculator to multiply or divide.)** (1.5 pts each)

7. $\dfrac{10!}{4! \times 6!}$

8. ${}_9P_3$

7. _____

8. _____

9. ${}_7C_3$

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

9. _____

10. _____

11. Ten people buy tickets for a raffle. 1st place wins \$100, 2nd place wins \$50, and 3rd place wins \$10. How many different arrangements of 1st, 2nd, and 3rd place winners are possible?

11. _____

12. In how many ways can 3 singers be selected from 5 who came to an audition?

12. _____

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

13. _____

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

14. _____

Expand the binomial raised to a power.

15. $(x+2y)^4$

Algebra 2 – Year 2 Name: _____

Review Sheet #1: Lessons 11.1-11.2, 11.8 Date: _____ Hour: _____

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.

1. A box contains 6 green, 5 yellow, and 3 purple balls. Find the probability of drawing a green ball in a single random draw. $6+5+3=14$

$P(\text{green}) = \frac{6}{14} = \frac{3}{7} = 0.429 \rightarrow 42.9\%$

1. $\frac{3}{7}$ (FRACTION) 42.9% (PERCENT)

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

1 2 3 4 5 6 $P(<5) = \frac{4}{6} = \frac{2}{3} = 0.667 \rightarrow 66.7\%$

2. $\frac{2}{3}$ (FRACTION) 66.7% (PERCENT)

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

Total 52 cards
4 kings & 4 aces $P(\text{king or ace}) = \frac{4+4}{52} = \frac{8}{52} = \frac{2}{13} = 0.154$

3. $\frac{2}{13}$ (FRACTION) 15.4% (PERCENT)

4. Find the number of possible passwords for 3 letters followed by 3 digits, with only consonants (consider "y" a consonant) and odd digits allowed.

26
− 5 vowels
21 consonants

1, 3, 5, 7, 9 = 5 odd digits

$21 \cdot 21 \cdot 21 \cdot 5 \cdot 5 \cdot 5 = 1{,}157{,}625$

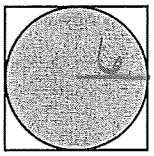
4. _____

5. An ice cream shop has 21 flavors of ice cream, 7 toppings, and 8 mix-ins. How many different sundaes can the shop make?

$21 \cdot 7 \cdot 8 = 1176$

5. _____

6. If one point is randomly selected from the points inside the rectangle shown below, find the probability that the point is in the circle. (Remember: Area of a circle = πr^2)



$r = 6$ $\quad \text{Area(circle)} = \pi(6)^2 = 36\pi$

$\text{Total area} = 12^2 = 144$

$P(\text{circle}) = \frac{36\pi}{144} = 0.785 \rightarrow 78.5\%$

6. _____

For problems 7-15, evaluate each expression. **(Show all work - Only use your calculator to multiply or divide.)** (1.5 pts each)

7. $\frac{10!}{4! \times 6!} = 210$

8. ${}_9P_3 = \frac{9!}{(9-3)!} = 504$

7. _____

8. _____

9. ${}_7C_3 = \frac{7!}{(7-3)!3!}$

$= 35$

10. $\frac{(7-3)! \times 3!}{2! \times 0!}$

$\frac{4!3!}{2!} = 72$

9. _____

10. _____

11. Ten people buy tickets for a raffle. 1st place wins \$100, 2nd place wins \$50, and 3rd place wins \$10. How many different arrangements of 1st, 2nd, and 3rd place winners are possible?

Order Matters! Permutation

${}_{10}P_3 = \frac{10!}{(10-3)!} = 720$

11. _____

12. In how many ways can 3 singers be selected from 5 who came to an audition?

Order Does NOT matter! Combination

${}_5C_3 = \frac{5!}{(5-3)!3!} = 10$

12. _____

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

Order does not matter! Combination

${}_{25}C_4 = \frac{25!}{(25-4)!4!} = 12650$

13. _____

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

$10 \cdot 9 \cdot 8 \cdot \ldots \cdot 1 = 10!$

$= 3628800$

14. _____

Expand the binomial raised to a power.

15. $(x+2y)^4$

$\binom{4}{0}x^4(2y)^0 + \binom{4}{1}x^3(2y)^1 + \binom{4}{2}x^2(2y)^2 + \binom{4}{3}x^1(2y)^3 + \binom{4}{4}x^0(2y)^4$

${}_4C_0$

$1 \cdot x^4 \cdot 1 + 4 \cdot x^3 \cdot 2y + 6 \cdot x^2 \cdot 4y^2 + 4 \cdot x \cdot 8y^3 + 1 \cdot 1 \cdot 16y^4$

$x^4 + 8x^3y + 24x^2y^2 + 32xy^3 + 16y^4$

Algebra 2 – Year 2
Review Sheet #2: Lessons 11.1, 11.2, 11.8

Names: _____
Date: _____ Hour: _____

Lesson 11.1 – Permutations & Combinations

1. In how many different orders can you line up 8 cards on a table?

2. In how many ways can 12 basketball players be listed in a program?

3. Suppose Ruth Ann has 3 routes she can choose from to get from school to the library, and 5 routes from the library to her home. How many routes are there from Ruth Ann's school to her home with a stop at the library?

4. A yogurt shop offers 6 different flavors of frozen yogurt and 12 different toppings. How many choices are possible for a single serving of frozen yogurt with one topping?

5. 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?

6. Evaluate ${}_9P_4$.

7. Evaluate $\frac{{}_{60}C_3}{{}_{15}C_3}$.

8. Evaluate ${}_7C_6$.

9. Eight teams enter a tournament. How many arrangements of 1st, 2nd, and 3rd place winners are possible?

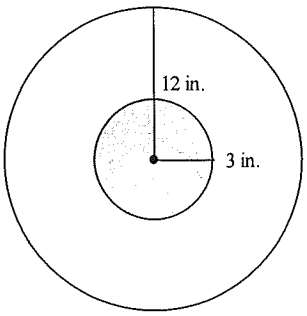
Lesson 11.2 - Probability

10. Lynn and Dawn tossed a coin 60 times and got heads 33 times. What is the experimental probability of tossing heads using Lynn and Dawn's results?

11. A bag contains 6 red marbles, 6 white marbles, and 4 blue marbles. Find P(red or blue).

12. A spinner is numbered from 1 through 10 with each number equally likely to occur. What is the probability of obtaining a number less than 2 in a single spin?

13. If a dart hits the target at random, what is the probability that it will land in the shaded region? (Remember: Area of a circle = πr^2)



Drawing not to scale

Lesson 11.8 – Binomial Theorem

Use the Binomial Theorem to find the binomial expansion of the expression.

14. $(a+b)^6$

Simplified answer: _____

15. $(c-3)^4$

Simplified answer: _____

Algebra 2 – Year 2
Review Sheet #2: Lessons 11.1, 11.2, 11.8

Names: _____
Date: _____ Hour: _____

Lesson 11.1 – Permutations & Combinations

1. In how many different orders can you line up 8 cards on a table?

$8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdots 1 = 8! = 40320$

2. In how many ways can 12 basketball players be listed in a program?

$12 \cdot 11 \cdot 10 \cdots 1 = 12! = 479001600$

3. Suppose Ruth Ann has 3 routes she can choose from to get from school to the library, and 5 routes from the library to her home. How many routes are there from Ruth Ann's school to her home with a stop at the library?

$3 \cdot 5 = 15$

4. A yogurt shop offers 6 different flavors of frozen yogurt and 12 different toppings. How many choices are possible for a single serving of frozen yogurt with one topping?

$6 \cdot 12 = 72$

5. 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? Order Does NOT matter!

Combination

$${}_7C_3 = \frac{7!}{(7-3)!3!} = 35$$

6. Evaluate ${}_9P_4$.

$$= \frac{9!}{(9-4)!} = 3024$$

7. Evaluate $\frac{{}_{60}C_3}{{}_{15}C_3}$.

$$= \frac{6844}{91} = 75.21$$

8. Evaluate ${}_7C_6$.

$$= \frac{7!}{(7-6)!6!} = 7$$

9. Eight teams enter a tournament. How many arrangements of 1st, 2nd, and 3rd place winners are possible?

Order matters! Permutation

$${}_8P_3 = \frac{8!}{(8-3)!} = 336$$

Lesson 11.2 - Probability

10. Lynn and Dawn tossed a coin 60 times and got heads 33 times. What is the experimental probability of tossing heads using Lynn and Dawn's results?

$$P(\text{heads}) = \frac{33}{60} = \frac{11}{20} = 0.55 \rightarrow 55\%$$

11. A bag contains 6 red marbles, 6 white marbles, and 4 blue marbles. Find P(red or blue).

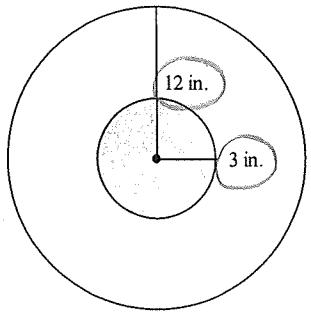
Total marbles = 16

$$P(\text{red or blue}) = \frac{6+4}{16} = \frac{10}{16} = \frac{5}{8} = 0.625 \downarrow 62.5\%$$

12. A spinner is numbered from 1 through 10 with each number equally likely to occur. What is the probability of obtaining a number less than 2 in a single spin? 1 2 3 4 5 6 7 8 9 10

$P(<2) = \frac{1}{10} = 0.1 \rightarrow 10\%$

13. If a dart hits the target at random, what is the probability that it will land in the shaded region? (Remember: Area of a circle = πr^2)



Drawing not to scale

Area(shaded) $= \pi(3)^2 = 9\pi$

Area(total) $= \pi(12)^2 = 144\pi$

$P(\text{shaded}) = \frac{9\pi}{144\pi} = \frac{1}{16} = 0.0625 \downarrow 6.25\%$

Lesson 11.8 – Binomial Theorem

Use the Binomial Theorem to find the binomial expansion of the expression.

14. $(a+b)^6$ 1 6 15 20 15 6 1

$1a^6b^0 + 6a^5b^1 + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6a^1b^5 + 1a^0b^6$

$a^6 + 6a^5b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$

Simplified answer: _____

15. $(c-3)^4$ 1 4 6 4 1

$1c^4(3)^0 - 4c^3(3)^1 + 6c^2(3)^2 - 4c^1(3)^3 + 1c^0(3)^4$

$c^4 - 12c^3 + 54c^2 - 108c + 81$

$4c^3 \cdot 3^1$

$4 \cdot c^3 \cdot 3$

$12c^3$

Simplified answer: _____