Name/Per: S2 Key

Algebra 2 Final Review 2014 – Semester 2

** You will be able to have ***ONE*** 4x6 note card (Front and Back) on your final!**

- Prioritize your studies by focusing on targets you scored low on 1st – there is a place to note old scores
- Each target is given at least one problem in this packet
- Review problems are listed next to each target – You will need your book
- Answer keys will be available in the classroom and online at www.mahonymath.weebly.com
- Small mini lessons will be scheduled each class – sign up for the ones you want to participate in
- After school help is available T/W/Th 2:45-4

Chapter 6:

Score	Target	Problems
	T 6-4: I can simplify radical expressions by adding and subtracting.	6.5 Pg. 419 #1-12all
	T 6-5: I can solve equations containing radicals and verify the solution.	6.7 Pg. #23-33all

1. Simplify the radical.

$\sqrt[3]{-216p^3q^9}$ = $-6pq^3$

2. $6\sqrt{20} + 8\sqrt{5} - 5\sqrt{45}$

$12\sqrt{5} + 8\sqrt{5} - 15\sqrt{5} = 5\sqrt{5}$

3. Solve the following equations and verify its solutions.

$2\sqrt{4x+8} - 4 = 8$

$\sqrt{4x+8} = 6$

$4x + 8 = 36$

$x = 7$

4. Solve the following equations and verify its solutions.

$\sqrt{3x+1} = \sqrt{5x} - 1$

$3x + 1 = 5x - 2\sqrt{5x} + 1$

$-2x = -2\sqrt{5x}$

$x = \sqrt{5x}$

$x^2 = 5x$

$x^2 - 5x = 0$

$x(x-5) = 0$

$x = 0$ or $x = 5$

Chapter 7:

Score	Target	Problems
	T7-1: I can describe transformations, graph and determine domain and range of exponential and logarithmic functions.	7.1 Pg. 455 #1-3, 8-11 7.3 Pg. #8-11, 46-48 State Domain and Range and describe transformations.
	T7-2: I can use the properties of exponents to write and solve equations and interpret real world scenarios.	7.2 Pg. 464 #1-4, 32-37
	T7-3: I can use the properties of logarithms to write and solve equations and interpret real world scenarios.	7.4 Pg. 480 #9-19o, 7.5 Pg. 489 #36-41, 51-57o
	T7-4: I can use exponential and logarithmic equations to solve real world scenarios.	T7-4 Applications Worksheet

Name/Per: _____

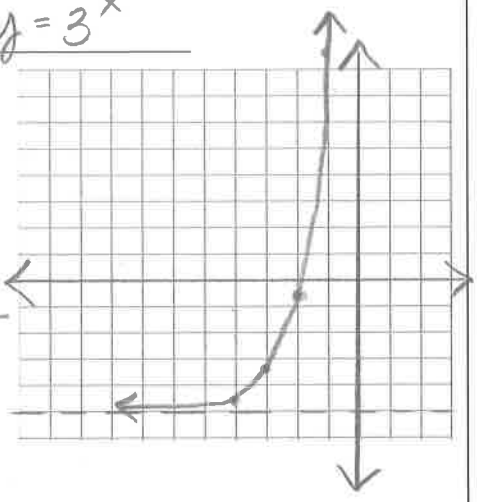
1. $y = \frac{1}{2}(3)^{x+4} - 5$

Parent function: $y = 3^x$

$a = \frac{1}{2}$

$h = -4$

$k = -5$



x	y

Domain: all R

Range: $y \geq -5$

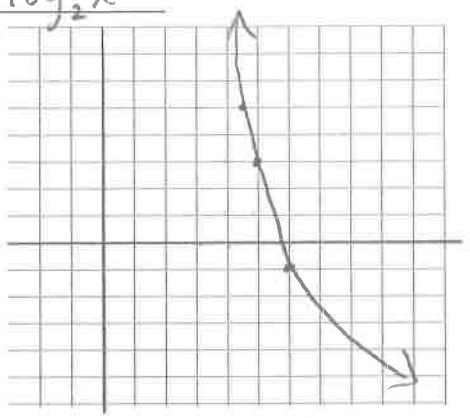
2. $y = -2\log_2(x-4) + 3$

Parent function: $y = \log_2 x$

$a = -2$

$h = 4$

$k = 3$



$2^y = x$

4.5	5
5	3
6	-1

$y = 2^x$

$\frac{1}{2}$	-1
1	0
2	1

-1	$\frac{1}{2}$
0	1
1	2

Domain: $x > 4$

Range: R

3. $8^{x-2} = \frac{1}{16}$

$16 = 2^4$

$(2^3)^{x-2} = 2^{-4}$

$3x - 6 = -4$

$x = \frac{2}{3}$

4. $6^x \cdot 36^{2x+4} = 216^{x+4}$

$6^x \cdot (6^2)^{2x+4} = (6^3)^{x+4}$

$x + 4x + 8 = 3x + 12$

$5x + 8 = 3x + 12$

$2x = 4$

$x = 2$

5. $3\log_5(x^2+9) - 6 = 0$

$\log_6(x^2+9) = 2$

$5^2 = x^2 + 9$

$0 = x^2 - 16$

$x = 4$

$x = -4$

6. $4\log_2 x + \log_2 5 = \log_2 405$

$5x^4 = 405$

$x^4 = 81$

$x = 3$

7. Write an exponential equation for an element with a rate of decay of 17% per day if the sample starts with 6,000 atoms.

   a. Equation: $y = 6000(1-.17)^x$

   b. How much would remain after 3 weeks? Round down to the nearest whole atom.

   119 atoms

Name/Per:_____

Statistics Chapter:

Score	Targets	Problems
	T Stat-1: I can find the mean, median, mode, and 5-number summary of a set of data.	Stat 1, 2, and 3 Review Worksheet
	T Stat-2: I can create and interpret a box plot given a set of data.	
	T Stat-3: I can find and interpret the standard deviation of a set of data.	

Determine Measures of Central Tendencies (Mean Median Mode). Create and label on an appropriate scale a box and whisker plot and find the standard deviation for the data. Show all work, use a calculator to verify.

Period 3Test Scores: 81, 97, 92, 65, 77, 89, 84, 68, 74, 93, 91, 85, 79, 84, 86, 90, 91, 84, 78, and 80.

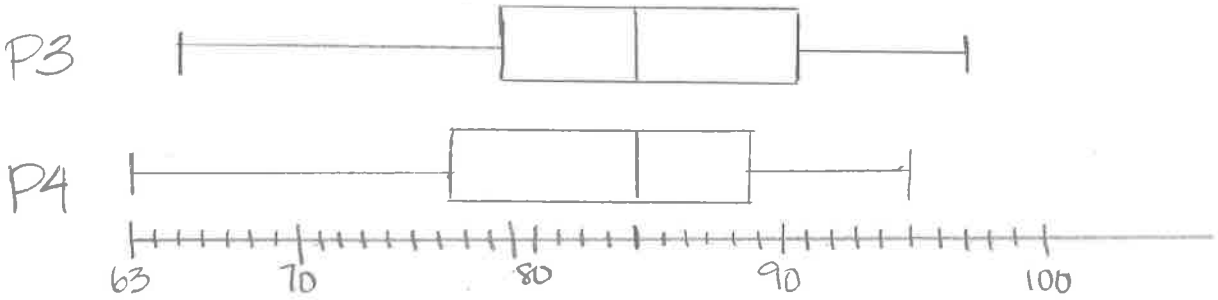
n=20

mean 83.4%
median 84
mode 84
sd 8.34

Period 4 Test Scores: 79, 95, 90, 63, 75, 87, 84, 66, 72, 91, 89, 85, 77, 84, 86, 88, 89, 84, 76, and 78.

n=20

mean 81.9
Med 84
Mode 84
Sd 8.47



Make three comparison statements using your data and proper vocabulary as to which class did better!

P3 has a higher min and max than P4.
P3 has a higher mean as well.
Both classes have a similar standard deviation, 8.3 and 8.4 showing they are pretty consistent w the mean - so the majority of students got between 75 - 90%, in P3.

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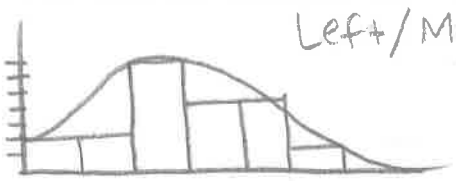
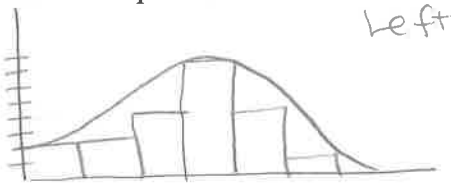
Chapter 11:

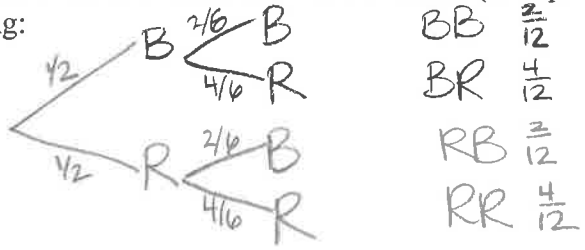
Scores	Targets	Problems
	T 11-2: I can describe a distribution of data and select appropriate measures of center and spread.	11.2 Pg. 738 #1-4all
	T 11-4: I can use Tree Diagrams to find probabilities.	Tree Diagram Worksheet
	T 11-5: I can use Venn diagrams to find probabilities.	Venn Diagram Worksheet

1. Use the above data from the Stat chapter and create a Histogram. Label it with the Measure of Central Tendencies and determine what values would be used for Center and Spread.





2. Create a tree diagram for the probabilities of spinning each spinner once. One spinner that has 6 black sections and 6 red sections (all equal). Another spinner has 2 black section and 4 red sections (all equal). Complete this tree diagram and then answer the following:



a. What is the probability of getting red twice?

$\frac{4}{12} = \frac{1}{3}$

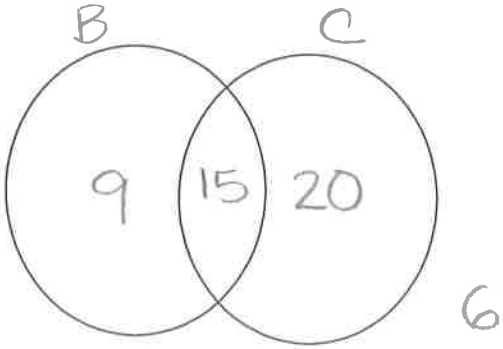
b. What is the probability of getting black at least once?

$\frac{2}{12} + \frac{4}{12} + \frac{2}{12} = \frac{8}{12} = \frac{4}{6} = \frac{2}{3}$

c. What is the probability of getting the same color twice?

$\frac{2}{12} + \frac{4}{12} = \frac{6}{12}$ $\left(\frac{1}{2}\right)$

3. Create a Venn Diagram
50 people were surveyed; they were asked what type of fast food they liked. 24 people said they liked burgers, 35 people said they like chicken and 15 people said they liked both burgers and chicken.
Create a Venn diagram with the following information and answer the following questions.



a. P(Burgers) = $24/50 = 12/25$

b. P(Chicken) = $35/50 = 7/10$

c. P(Burger |Chicken) = $\frac{15}{35} = \frac{3}{7}$

d. P(Not Burger and Not Chicken) = $\frac{6}{50} = \frac{3}{25}$

e. P(Burger OR Chicken) = $\frac{44}{50} = \frac{22}{25}$

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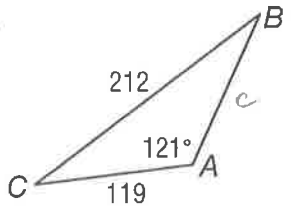
Chapter 12:

T 12-1: I can solve for missing sides and angles in right triangles using right triangle trigonometry (SOHCAHTOA).	12.1 Pg. 795 #1-12all
T 12-2: I can solve for missing sides and angles in triangles using Law of Sines, and Law of Cosines.	12.4 Pg. 818 # 21-28all 12.5 Pg. 825 #1-8all

Solve the triangle for all missing measurements.

1.



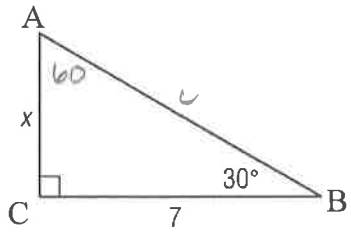
$\frac{\sin 121}{212} = \frac{\sin B}{119}$ $\frac{\sin 30.34}{c} = \frac{\sin 121}{212}$

$B = 28.76°$

$C = 30.24°$

$c = 124.93$

2.



$\tan 30 = \frac{x}{7}$

$x = 4.04$

$c = 8.08$

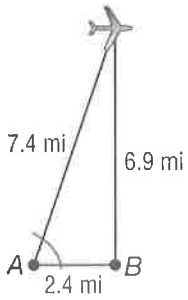
$A = 60°$

3. **SATELLITES** Two radar stations are 2.4 miles apart are tracking an airplane. The straight-line distance between Station *A* and the plane is 7.4 miles. The straight-line distance between Station *B* and the plane is 6.9 miles. What is the angle of elevation from Station *A* to the plane? Round to the nearest degree.

$6.9^2 = 7.4^2 + 2.4^2 - 2(7.4)(2.4)\cos\theta$

$\theta = 68.687$

69°



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Target 7-4 Applications Worksheet

Write and equation for each problem and then solve accordingly.

1. Find a bank account balance if the account starts with $100, has an annual rate of 4%, how long will it take to double your money?

   Equation: $y = 100(1.04)^x$

   Solution: 17.67 yrs

2. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%. How long until there are only 10mg of ibuprofen left in the body?

   Equation: $y = 400(.71)^x$

   Solution: 10.77 hrs

3. In 1985, there were 285 cell phone subscribers in the small town of Centerville; the number of subscribers increased by 75% per year after 1985. How long until the cell phone subscribers are above 25,000?

   Equation: $y = 285(1.75)^x$

   Solution: 1993 or 8 yrs

4. In 2003, the population of the town of Juniper was 9,562. By 2010, it was estimated at 18,942. Write an exponential function that could be used to model the population of Juniper. Write t in terms of the numbers of years since 2003. Predict the population in 2015. What percent is the population growing by?

   Equation: $y = 9562(1.10)^x$

   Solution: 30,009 people

   Percent growth rate: 10%

5. A laptop computer loses 8% of its value each month after it is purchased. If you purchase a new laptop for $2300 what will be the value after 3 months? In what month after purchase will the laptops worth fall below $1000?

   Equation: $y = 2300(.92)^x$

   Solution: $1790.98

   Solution: 10.12 months

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6. The population of an animal species introduced into an area sometimes increases rapidly at first and then more slowly over time. A logarithmic function models this kind of growth. Suppose that a population of N rabbits in an area t months after the rabbits are introduced is given by the equation:

$$N = 550 \log(4t + 2)$$

Use this model to predict the rabbit population after…

a. 4 months? 690 rabbits

b. 8 months? 842 rabbits

c. 3 years? 1190 rabbits

According to this model how long will it take for the rabbit population to reach 1000?

$t \approx 15.64$ months

6. How much would you need to invest to get \$20,000 in 5 years at an annual interest rate of 8.5% compounded monthly? $y = a\left(1 + \frac{.085}{12}\right)^{12t}$

Equation: $20{,}000 = a(1.007)^{60}$

Solution: \$13,157.89

7. You deposit \$2000 in a bank account. Find when you have \$7,000 for the following situations:

a. The account pays 3.5% annual interest compounded monthly.

Equation: $y = 2000(1.0029)^{12t}$

Solution: 36.05 yrs

b. The account pays 4.5% annual interest compounded quarterly.

Equation: $y = 2000(1.011)^{4t}$

Solution: 28.63 yrs

c. The account pays 4% annual interest compounded yearly

Equation: $y = 2000(1.04)^{t}$

Solution: 31.94 yrs

Name/Per:_____

Stat 1, 2, and 3 Review Worksheet

For the following problem find the following data by hand and verify by calculator. Measures of Central Tendencies, Box and Whisker Plot and 5# Summary and Standard Deviation.

Period 1 Test Scores: 100, 100, 91, 93, 93, 94, 94, 95, 95, 95, 97, 82, 84, 86, 87, 87, 88, 88, 89, 74, 75, 77, 77, 79, 79, 56, 58, and 59.

mean: $\frac{2371}{28} = 84.71$

Mode: 95

Stdev: 12.08

Period 5 Test Scores: 32, 34, 40, 42, 51, 51, 53, 57, 62, 63, 64, 64, 66, 68, 71, 73, 75, 76, 77, 79, 82, 85, 86, 88, 88, 93, and 96.

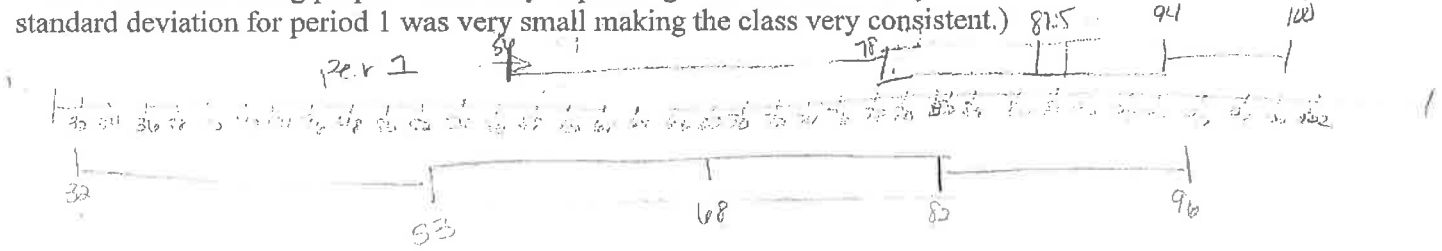
mean: $\frac{1816}{27} = 67.26$

med: 68

mode: 51, 64, 88

Stdev: 17.85

Write 5 sentences using proper vocabulary explaining what the data tells you about the two sets of data. (I.e. the standard deviation for period 1 was very small making the class very consistent.)



For the following problem find the following data by calculator. Measures of Central Tendencies, Box and Whisker Plot and 5# Summary and Standard Deviation.

Professor Baker and Doctor Cooper keep a record of their golf scores, as shown in the table below.

Professor Baker	
Score	Frequency
70	3
71	4
72	4
73	4
74	3
75	2

$\bar{x} = 72.3$

Stdev: 1.59

med: 72

mode: 71, 72, 73

Doctor Cooper	
Score	Frequency
68	3
70	4
72	3
74	5
77	3
79	2

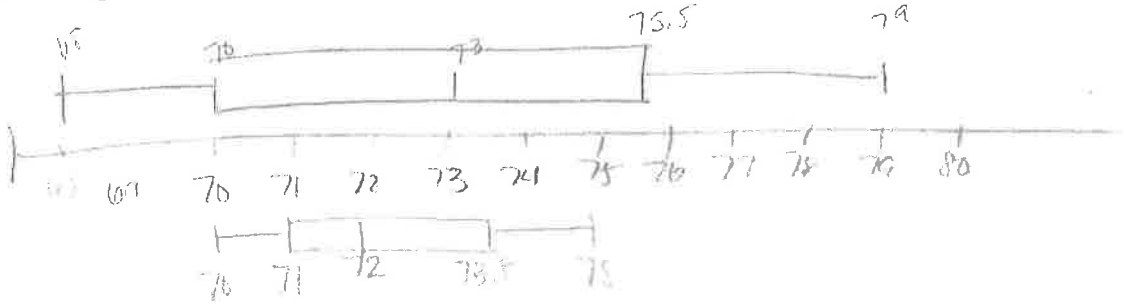
$\bar{x} = 72.95$

Stdev: 3.55

med: 73

mode: 74

Write 5 sentences using proper vocabulary explaining what the data tells you about the two sets of data. (I.e. the standard deviation for period 1 was very small making the class very consistent.)



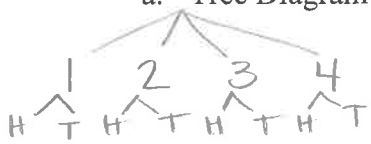
Name/Per:_____

T 11-4 Retake Problems

I can use Tree diagrams to find probabilities.

1. A dice numbered 1 to 4 is rolled and 1 coin is tossed. **Draw a tree diagram and LIST the possible outcomes.**

a. Tree Diagram



b. Outcomes

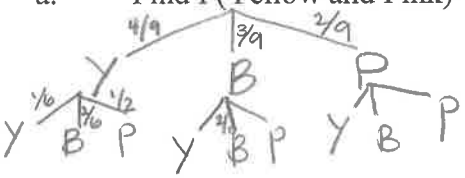
1H 3H 5H
1T 3T 5T
2H 4H 6H
2T 4T 6T

c. Find P(4 and H)

$\frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

2. A bag contains 4 yellow marbles, 3 blue marbles, and 2 pink marbles. A spinner has 1 yellow section, 2 blue sections and 3 pink sections (all equal size). Draw a tree diagram for the possible outcomes if you pick a marble and then spin the spinner.

a. Find P(Yellow and Pink)



b. Find P(Yellow or Pink)

NOT BB

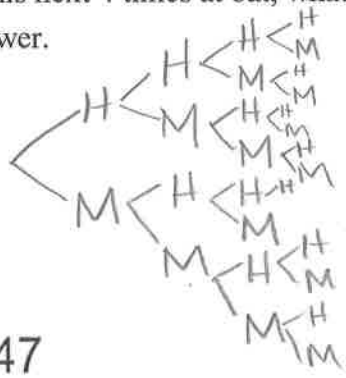
$1 - \frac{3}{9} \cdot \frac{2}{6} = 1 - \frac{1}{9} = \frac{8}{9}$

c. P(Two Yellow)

$\frac{4}{9} \cdot \frac{1}{6} = \frac{2}{27}$

3. A batter's probability of getting a hit is $\frac{1}{3}$. In his next 4 times at bat, what is the probability that he will get at least 3 hits? Draw a tree diagram to find the answer.

$\frac{1}{81} + \frac{2}{81} + \frac{2}{81} + \frac{2}{81} = \frac{7}{81}$



HHHH — $(\frac{1}{3})^4$ 1/81
HHHM — $(\frac{1}{3})^3(\frac{2}{3})$ 2/81
HHMH — $(\frac{1}{3})^3(\frac{2}{3})$ 2/81
HHMM
HMHH — $(\frac{1}{3})^3(\frac{2}{3})$ 2/81
HMHM
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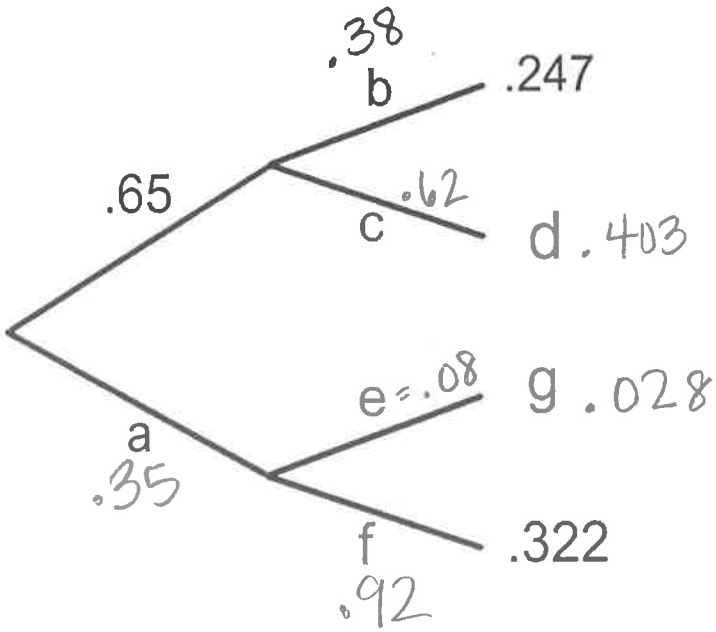
MMMM

4. Find the missing values:

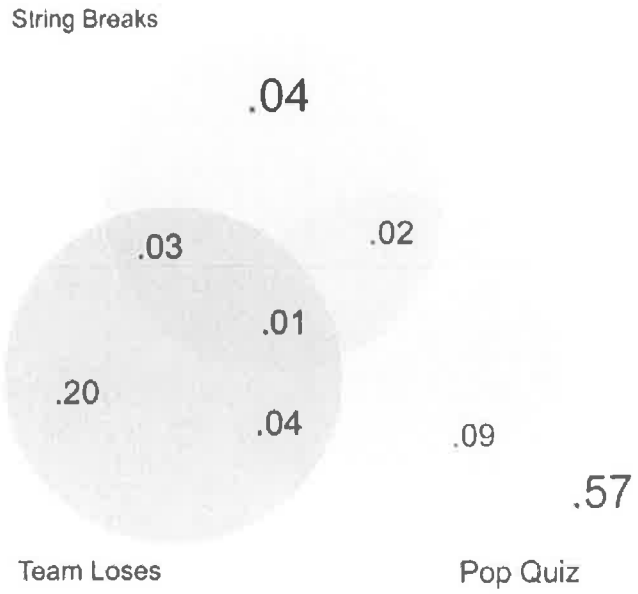


Name/Per:_____

T11-5 Retake Problems
I can use Venn diagrams to find probabilities.

Find the probability of:

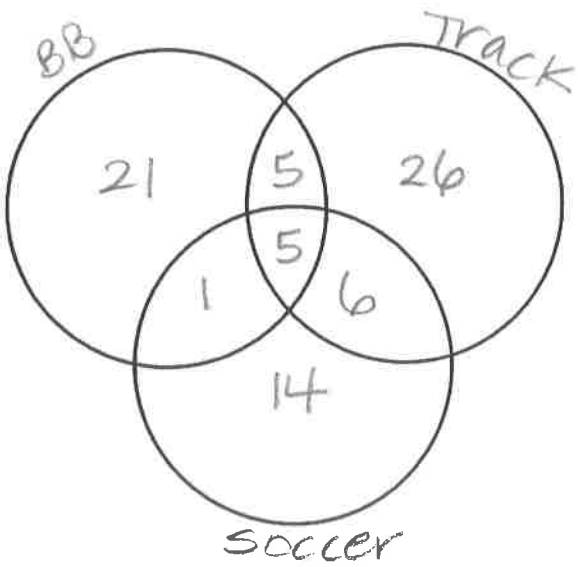
1. P(Team Loses and Pop Quiz) = .05
2. P(String Breaks or Pop Quiz) = .23
3. P(Team Loses or Pop Quiz) = .40
4. P(pop quiz)= .16
5. P(one bad event)= .33
6. P(no bad events) = .57
7. P(really bad day-all bad events)= .01
8. P(Team loses | Pop Quiz)= .3125
9. P(Team loses | String Breaks)= .4
10. P(String Breaks | Team loses)= .1429



11. Create a Venn Diagram

100 People were asked if they like Basketball, Track and Soccer.

- 5 people liked all three
- 6 liked Basketball and Soccer
- 11 liked Soccer and Track
- 10 liked Track and Basketball
- 42 liked Track
- 32 liked Basketball
- 26 liked Soccer



12. Out of forty students, 14 are taking English Composition and 29 are taking Chemistry. Draw your own Venn diagram

a) If five students are in both classes, how many students are in neither class? 2
b) How many are in either class? 38
c) What is the probability that a randomly-chosen student from this group is taking only the Chemistry class?
d) What is the probability that a randomly-chosen student from this group is taking English given they are already taking Chemistry?

c) 3/5

d) 5/29