Algebra 31 Final Exam Review

Please use this review sheet along with your <u>textbook</u>, <u>daily notes</u>, <u>quizzes</u> and <u>tests</u> to study for the exam.

First Semester Review:

Factor the polynomial completely.

1. $16x^3 - 44x^2 - 42x$
2. $36x^3 - 15x^2 + 84x - 35$
3. $32x^5 - 108x^2$
4. $(x^3 - 64)$
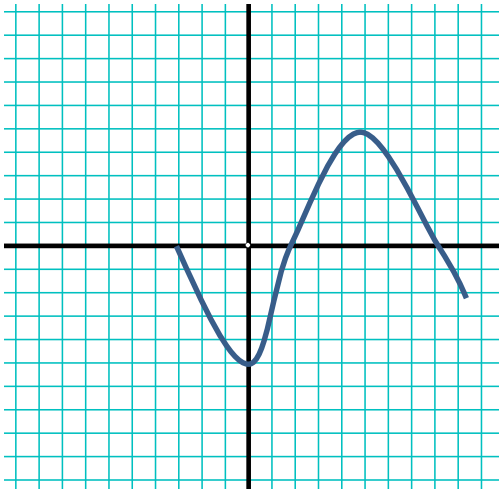5. $2x^3 - 6x^2 + 4x - 12$

Find all the real zeros of the function

6. $f(x) = 2x^3 - 3x^2 - 14x + 15$
7. $f(x) = 3x^3 + 4x^2 - 35x - 12$

8. Solve $\sqrt[3]{(3x+1)} + 6 = 8$

9. Evaluate $8^{\frac{-2}{3}}$

10. Which equation could be the equation to match the cubic function below? Explain your choice below.

   a. $g(x) = -2(x - 2)(x - 8)(x + 3)$
   b. $g(x) = -(x - 2)(x + 8)(x + 3)$
   c. $g(x) = 3(x - 2)(x - 8)(x + 3)$
   d. $g(x) = 2(x - 2)(x + 8)(x - 3)$

11. Solve: $\dfrac{1}{3} = 9^{(5x-7)}$

12. Write a polynomial function of least degree that has real coefficients, the given zeros, and a leading coefficient of 1.

   Zeros are 2, -2, 3i,

13. Divide using long division: $\left(4x^3 + 6x^2 - x - 4\right) \div \left(2x + 1\right)$

14. Solve: $\sqrt{(x+12)} = x$

15.   If $3800 is invested at a rate of 4.5%, what is the balance in the account after 3 years (calc):
       a) compounded continuously
       b) compounded monthly
       c) compounded daily

16.   Solve for x to the nearest tenth. (calc) $4.5^x = 32$
17.   Solve: $e^{-.05x} = 12$ Round to the nearest hundredth. (calc)

18.   Solve the equation: $\dfrac{2}{a^2 - 9} = \dfrac{5}{a+3}$

19.   You deposit $3000 in an account that pays 6% annual interest. Find the balance after 2
       years if the interest is compounded quarterly.

20.   Solve: $8 = \left(\dfrac{1}{4}\right)^{3x-6}$
21.   Find all the real zeros of $f(x) = 2x^4 + 5x^3 - 11x^2 - 20x + 12$
22.   Solve the equation: $\sqrt[4]{x^2 - 8} = 2$
23.   List the potential/possible rational zeros for the polynomial:
              $3x^3 + 2x^2 - 10x + 12$
24.   If Mary purchased an antique clock for $300 and its' value is appreciating over time by 4.5%.
       Write an equation to model the new price of her clock after t years. Then state the
       growth/decay factor.

24.   Use the following polynomial to answer all questions: $g(x) = -2x^5 - 13x^2 + 6$
            a.   Identify the degree: _____
            b.   y-intercept: _____
            c.   End behavior:
                      $as\ x \to \infty$ $f(x) \to$ _____
                      $as\ x \to -\infty$ $f(x) \to$ _____

25.   State the zeros of the polynomial and whether the graph crosses or touches at the zeros.

   y = 2x(x – 4)²(x + 1)(x – 8)³

       Example: Zero: _____ touches/crosses?

Trigonometry Review

Find the Quadrant in which each angle lies, find the angle's reference angle, and determine the sine, cosine and tangent for each angle. List two other angles (one positive and one negative) that are co-terminal to the given angle (terminal ray that ends in the same spot)

Degrees	Radians	Quadrant	Ref. θ	Cos θ	Sin θ	Tan θ	(+)Coterminal	(-)Coterminal
90°								
	$\frac{3\pi}{4}$							
- 600°								
540°								
- 780°								
	$\frac{\pi}{6}$							
330°								

1. Graph $f(x) = -2\sin\left(\frac{x}{2}\right) - 1$. Label y axis with appropriate scale, list points for local minimums and maximums, write the equation for the midline, list the period, and domain and range.
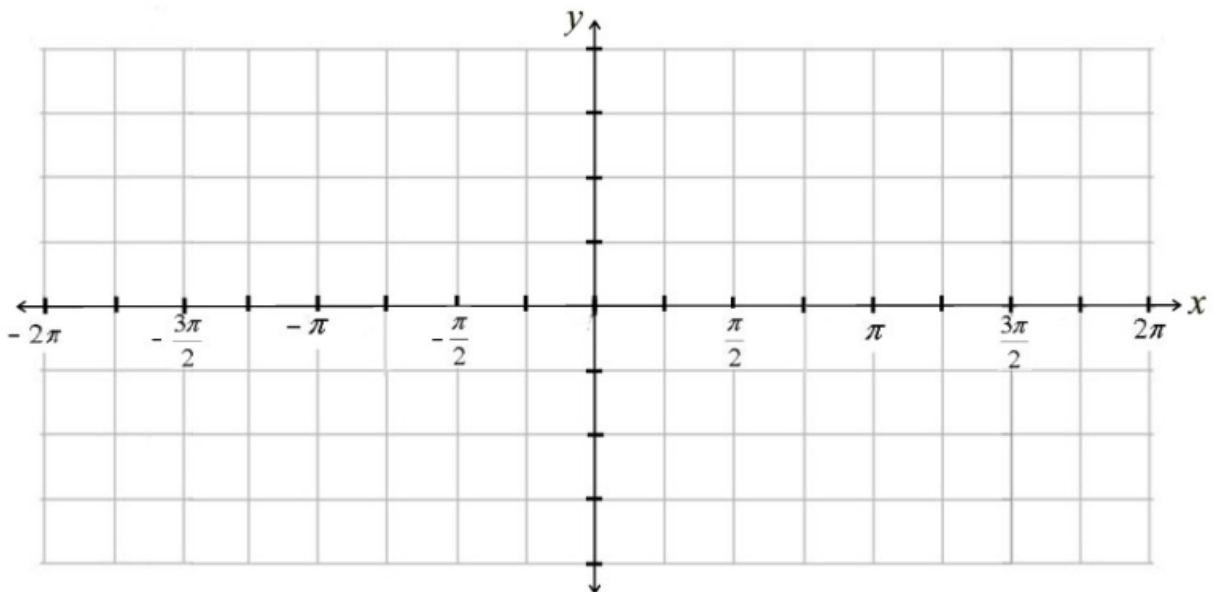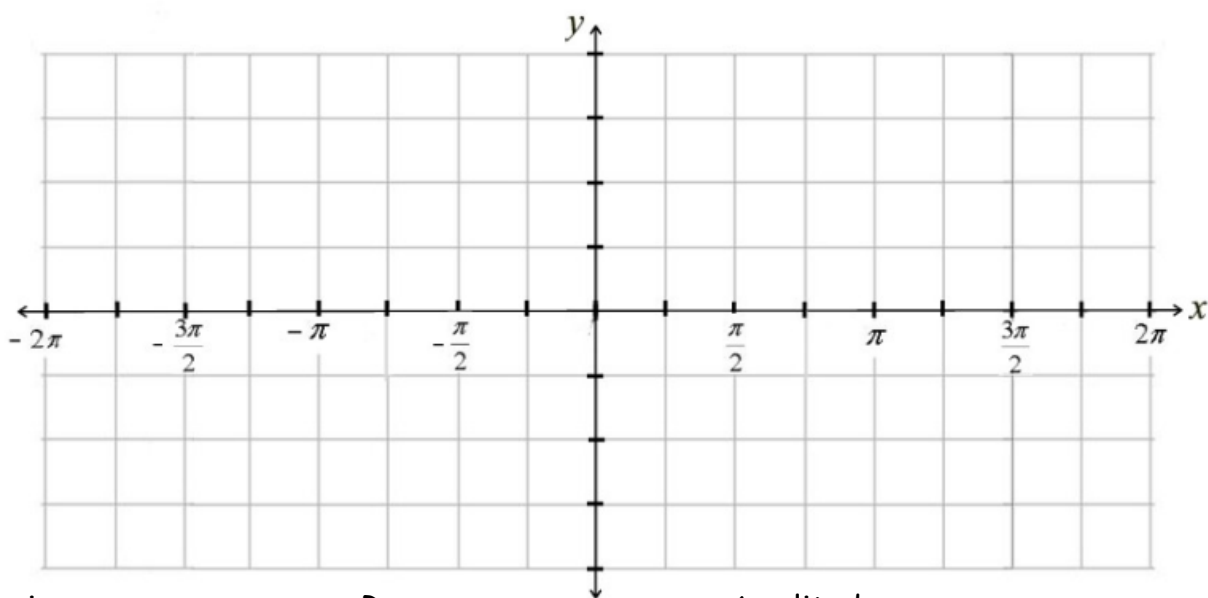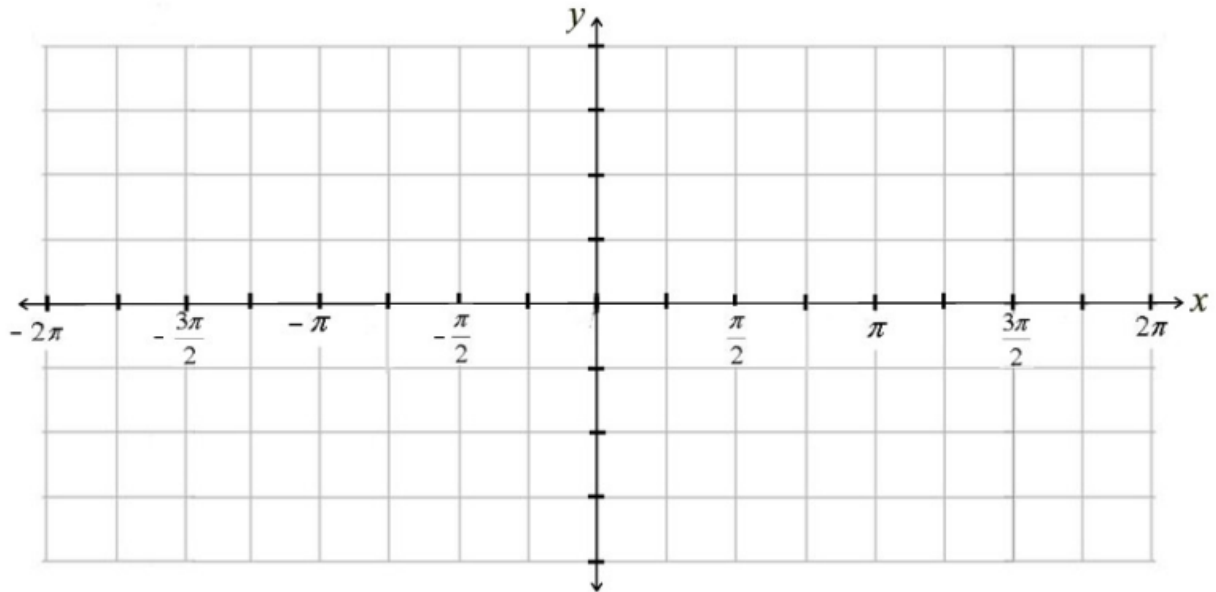

a) Domain: _____ Range: _____ Amplitude: _____

   Phase Shift: _____ Vertical Slide: _____ Period: _____

   Maximum: _____ Minimum: _____

2. Graph $f(x) = 3\cos\left(x - \dfrac{\pi}{4}\right)$. Label both axes with appropriate scales, list points for local minimums and maximums, write the equation for the midline, list the period, and domain and range.
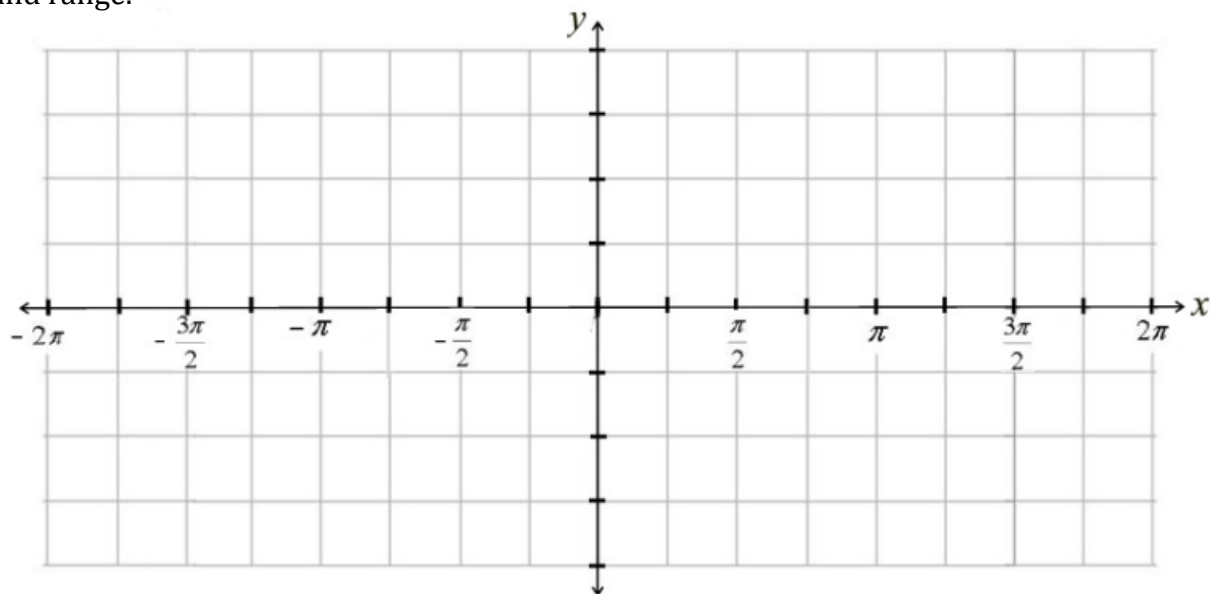
Domain: _____ Range: _____ Amplitude: _____
Phase Shift: _____ Vertical Slide: _____ Period: _____
Maximum: _____ Minimum: _____

3. Graph $f(x) = 2\sin(x) - 1$. Label y axis with appropriate scale, list points for local minimums and maximums, write the equation for the midline, list the period, and domain and range.

b) Domain: _____ Range: _____ Amplitude: _____
   Phase Shift: _____ Vertical Slide: _____ Period: _____
   Maximum: _____ Minimum: _____

4. Graph $f(x) = -2\cos(2x) + 2$. Label both axes with appropriate scales, list points for local minimums and maximums, write the equation for the midline, list the period, and domain and range.

Domain: _____ Range: _____ Amplitude: _____

Phase Shift: _____ Vertical Slide: _____ Period: _____

Maximum: _____ Minimum: _____

5. If $\sin\theta = \dfrac{\sqrt{2}}{5}$ and $90 < \theta < 180$ what is $\tan\theta$ and $\cos\theta$?

6. If $\cos\theta = -\dfrac{5}{13}$ and $180 < \theta < 270$ what is $\sin\theta$ and $\tan\theta$?

7. If $\sin\theta = \dfrac{8}{17}$ what are the possible values of $\cos\theta$ and $\tan\theta$?

8. If $\sin\theta = \dfrac{\sqrt{5}}{5}$ and $90 < \theta < 180$ what are the possible values of $\cos\theta$ and $\tan\theta$?

9. Place the expressions from least to greatest.

   a) $\sin(25°)$ $\sin(40°)$ $\sin 100°$ $\sin 180°$

10. Given a period of 4π what is ω?

4. Write a sine equation for the periodic function.
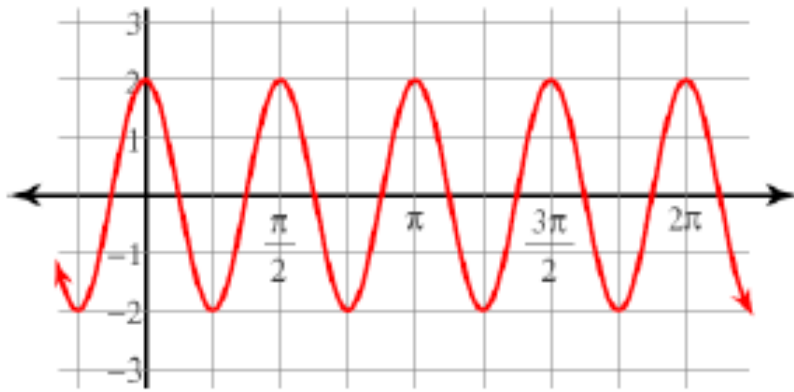
(You can write cosine equation as an option as well!)   Either is acceptable!

Write a sine and cosine equation for the periodic function.
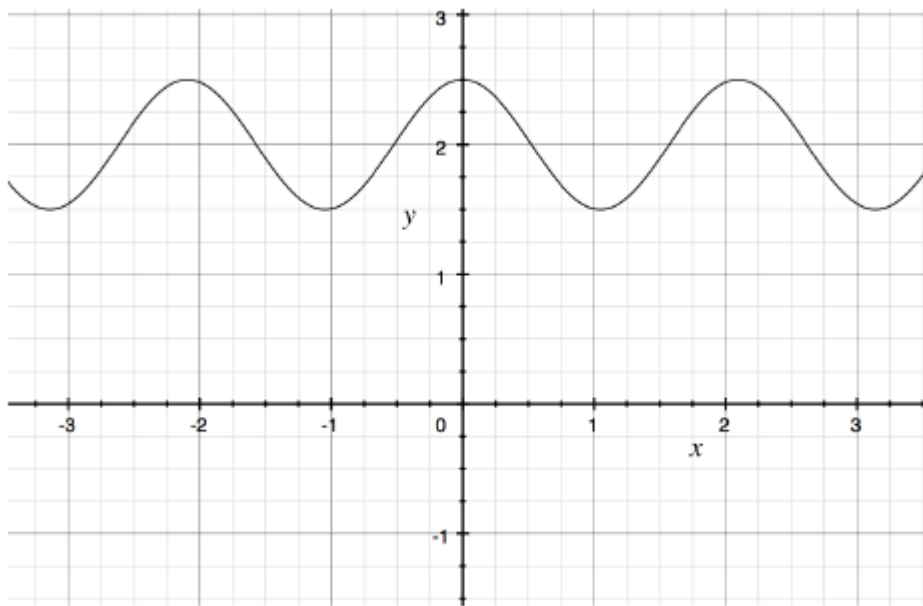
Probability Review

1) A combination lock has 50 numbers on it. How many different 3-digit lock combinations are possible if no digit can be repeated?

2) A club elects a president, vice-president, and secretary-treasurer. How many sets of officers are possible if there are 11 members and any member can be elected to each position?   No person can hold more than one office.

3) From 9 names on a ballot a committee of 4 will be elected to attend a political national convention. How many different committees are possible?

4) A bag contains 7 red marbles, 3 blue marbles, and 6 green marbles. What is the probability of choosing a blue marble when one marble is drawn?

5) Give the probability that the roll of a standard 6-sided die will show a 6 or a 4.

6) Determine how many different computer passwords are possible if 2 digits followed by 5 letters:
    a) digits and letters can be repeated:
    b) digits and letters cannot be repeated:

7) $\dfrac{9!}{4!4!}$ 8) $_7P_7$ 9) $_7C_5$

10) You have an equally likely chance of choosing any integer from 1 through 50. Find the probability of the given event.

    a) an even number   b) A perfect square   c) Zero is chosen

When a fish is selected at random from a tank, the probability that it has a green tail is 0.64, the probability that it has red fins is 0.25, and the probability that it has both a green tail and red fins is 0.19.
   a.   Draw a Venn diagram to represent this information.
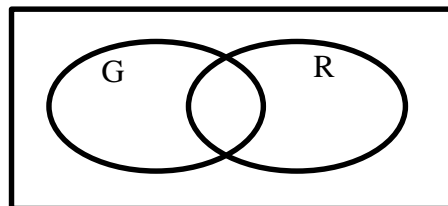
    b.   Find the probability that the fish has
       i.   red fins but does not have a green tail.

      ii. a green tail but not red fins.

     iii. neither a green tail nor red fins.

   c.   Complete the table below showing the probabilities of the events corresponding to the cells of the table.

	Green Tail	Not Green Tail	Total
Red Fins			
Not Red Fins			
Total			

1) On a flight, some of the passengers have frequent flier status and some do not. Also, some of the passengers have checked baggage and some do not. Let the set of passengers who have frequent flier status be F and the set of passengers who have checked baggage be C. On the Venn diagrams provided, shade the regions representing passengers who:
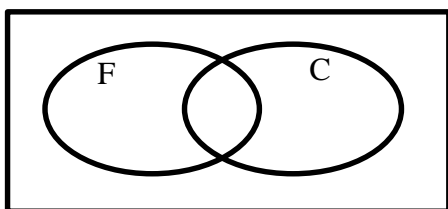
a) have frequent flier status and
   have checked baggage
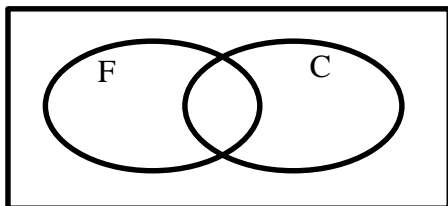
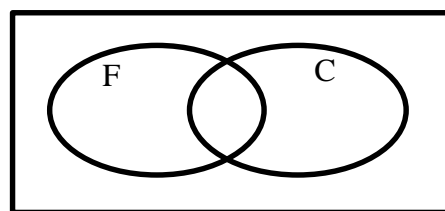

b) have frequent flier status or
   have checked bagged
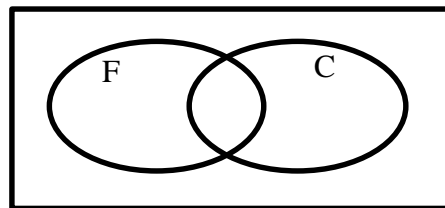
c) do not have checked baggage

d) have frequent flier status

2) Now think about the cars available at a dealership. Suppose a car is selected at random from the cars at this dealership. Let the event that the car has manual transmission be denoted by M, and let the event that the car is a sedan be denoted by S. The Venn diagram below shows the probabilities associated with four of the regions of the diagram.

a. What is the value of $P(M \cap S)$?

b. Complete the sentence using and/or:

$P(M \cap S)$ is the probability that a randomly selected car has a manual transmission _____ is a sedan.
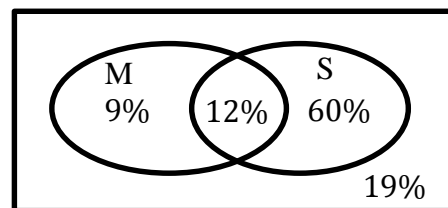
c. What is the value of $P(M \cup S)$?

d. Complete the sentence using and/or:

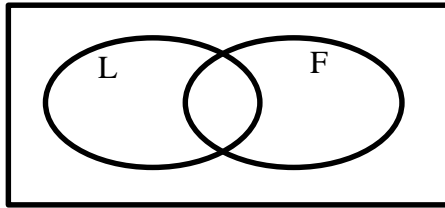$P(M \cup S)$ is the probability that a randomly selected car has a manual transmission _____ is a sedan.

e. What is the value of $P(SC)$?

f. Explain the meaning of $P(SC)$.

3) A credit card company states that 42% of its customers are classified as long-term cardholders, 35% pay their bills in full each month, and 23% are long-term cardholders who also pay their bills in full each month. Let the event that a randomly selected customer is a long-term cardholder be L, and the event that a randomly selected customer pays his or her bill in full each month be F. Use the probabilities given, do not need to subtract the overlap.

    a. What are the values of (L), (F), and $(L$ and $F)$?

   b. Draw a Venn diagram, and label it with the probabilities from part (a).

    c. What is the probability that a randomly selected customer is a long-term cardholder given that the customer pays his or her bill in full each month? (Round your answer to the nearest thousandth.)

    d. What is the probability that a randomly selected customer pays his/her bill in full each month, given that he/she has been a long term cardholder? (Round your answer to the nearest thousandth.)

    e. Which is greater, P(F|L) or the P(F)? Explain why this is relevant.

    f. Remember that two events A and B are said to be independent if $(A$ given $B)=P(A)$. Are the events F and L independent? Explain.

5) According to www.census.gov, based on the US population in 2010, the probability that a randomly selected male is 65 or older is 0.114, and the probability that a randomly selected female is 65 or older is 0.146. (In the questions that follow, round your answers to the nearest thousandth.)

    a. If a male is selected at random and a female is selected at random, what is the probability that both people selected are 65 or older?

    b. If two males are selected at random, what is the probability that both of them are 65 or older?

    c. If two females are selected at random, what is the probability that neither of them is 65 or older?

6) Oostburg College has a rather large marching band. Engineering majors were heard bragging that students majoring in engineering are more likely to be involved in the marching band than students from other majors. If the above claim is accurate, does that mean that most of the band is engineering students? Explain your answer.

The following graph was prepared to investigate the above claim.
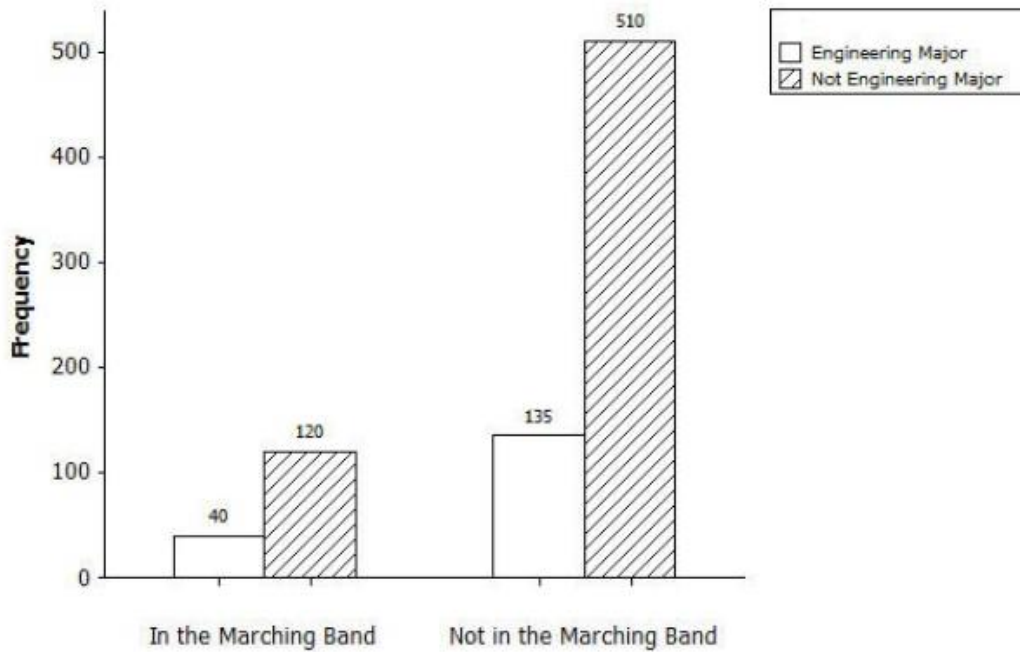
a) Based on the graph, complete the following two-way frequency table:

	Marching Band	Not in Marching Band	Total
Engineering Major			
Not an Engineering Major			
Total			

b) Based on the completed two-way frequency table, determine the following and explain how you got your answer. Show fraction and decimal (round to three decimal places)

 i. The probability that a randomly selected student is in the marching band.
 ii. The probability that a randomly selected student is an engineering major.
 iii. The probability that a randomly selected student is in the marching band and an engineering major.
 iv. The probability that a randomly selected student is in the marching band and not an engineering major.
 v. A randomly selected student is majoring in engineering. What is the probability that this student is in the marching band?
 vi. A randomly selected student is not majoring in engineering. What is the probability that this student is in the marching band?
 vii. The claim that started this investigation was that students majoring in engineering are more likely to be in the marching band than students from other majors. Describe the conditional probabilities that would be used to determine if this claim is accurate.

7) A survey of registered voters in a city in Connecticut was carried out to assess support for a new school tax. 51% of the respondents supported the school tax. Of those with school-age children, 56% supported the school tax, while only 45% of those who did not have school-age children supported the school tax.

    a. If a person who responded to this survey is selected at random, what is the probability that
        i. the person selected supports the school tax?

        ii. the person supports the school tax given that he or she does not have school-age children?

    b. Are the two events has school-age children and supports the school tax independent? Explain how you know this.

    c. Suppose that 35% of those responding to the survey were over the age of 65 and that 10% of those responding to the survey were both over age 65 and supported the school tax. What is the probability that a randomly selected person who responded to this survey supported the school tax given that he or she was over age 65?
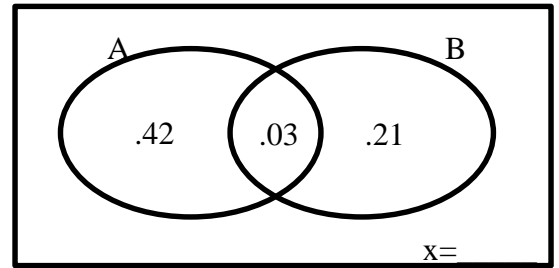
8) 3 coins are tossed. Find the probability that exactly 2 coins show tails, given the 3rd coin shows tails.

A) Review of Probability: includes symbols, Venn diagrams, independence, conditional prob. and two-way tables.

1) Use the Venn Diagram to answer the questions.

    a. Find x:

    b. P(A U B) =

    c. P(A ∩ B) =

    d. P(A^c) =

    e. P(B^c) =

    f. P(A^c ∩ B) =

    g. Shade your answer to 'f' in the diagram.

2) Use the two-way table to answer the questions.

	Men	**Women**	Totals
Color Blind	420	16	
Not Color Blind	5580	3984	
Totals			

    a. Fill in the remaining values in the table.
    b. What is the probability of a randomly selected individual being color-blind?
    c. What is the probability of a man being color blind?
    d. What is the probability of a woman being color blind?
    e. What is the probability of being color blind given that you are a man?
    f. Are being color blind and being a man independent? Support your answer with work.

B) Understanding statistics vocabulary.

3) Some people who race greyhounds give the dogs large doses of Vitamin C in the belief that the dogs will run faster. Investigators at the University of Florida tried two different diets to test this theory. One group of 10 greyhounds was given Vitamin C in their diet and another group of 10 greyhounds was not given any Vitamin C.
    a. Is this an experiment, survey or observational study? Explain your choice.
    b. If it is an experiment: identify the subjects, treatment and response variable.
    c. What is the sample and what is the population?

4) An examiner studies the life expectancy of individuals in America. He compares the life span of 1000 random citizens who passed away in the last century, half of which lived in the Midwest and half of which lived on the west coast.
   a. Is this an experiment, survey or observational study? Explain your choice.
   b. If it is an experiment: identify the subjects, treatment and response variable.
   c. What is the sample and what is the population?

5) A scientist compares the effectiveness of a 16-week, high intensity resistance-training program twice a week. Half of the group was 60 years-old and the other half was 75 year-olds. They found the leg muscles of men at age 60 were **50%** stronger compared to 80% stronger for 75 year olds.
   a. Is this an experiment, survey or observational study? Explain your choice.
   b. If it is an experiment: identify the subjects, treatment and response variable.
   c. Is **50%** a statistic or a parameter? Explain.

6) State whether each survey would be _biased_ or _unbiased_. Explain why.
   a. A marketing firm is trying to decide which of three golf courses in the area is the best, so it randomly surveyed people at a sports store in a local mall.
   b. Researchers waited outside of a Yankees game, and asked every 10th person their favorite sport.
   c. Hoping to learn what issues may resonate with voters in the coming election, the campaign director for a mayoral candidate selects one block from each of the city's election districts and interviewed every 4th person.

7) A researcher examined the records of 100 students and found a strong relationship between the height of students in an elementary school and how well they did on a reading test
   a. Is this an example of an experiment or an observational study? Explain.
   b. Explain what might be a lurking variable in this scenario.

8) Is the following an effort to conduct a sample or a census? Explain.

   A mailing with a School Climate Survey is sent to every home in Fairfield with children in Warde.

C) **_Using your calculator to find statistics._ (1-VarStats)**
   9) The water temperature in an outdoor pool is measured 12 times during a certain week. The temperatures in degrees Fahrenheit are: 74, 82, 78, 73, 78, 72, 78, 76, 74, 78, 78, 76
      i. Mean =

      ii. Median =

      iii. Standard Deviation (S_x)=

      iv. Range =

10) The shoe sizes of a group of 10 students are: 6, 7.5, 7, 8, 9, 8, 7, 9.5, 7, 7.5

      i. Mean =

      ii. Median =

      iii. Standard Deviation (S_x)=

      iv. Range =

D) *Random Selection vs. Random Assignment and Using RandInt for Samples and Simulations*

11) I wish to estimate the average grade for all of my period 5 students on their last test. I look at the test scores of 6 students I choose at random and find the average of the sample. Is this an example of random selection or random assignment? Explain.

12) I want to know if eating candy affects the focus of students while in class. I choose 11 students at random and give them candy and the other 11 students in the class do not get candy. Is this an example of random selection or random assignment? Explain.

13) I assign all 19 students in my period 9 class a number from 1 to 19. Use your calculator to select a sample of 4 students from the class.

    a. What did you type in your calculator?

    b. What are the results?

14) A child is selecting 5 goldfish at PetCo from large tank that contains 60% all orange goldfish, 30% white & orange goldfish, and 10% orange & black goldfish. How can we use RandInt to simulate 5 fish being removed from the tank at random? Explain fully how you are assigning digits and carry out 2 repetitions of simulating selecting fish from the tank.

    a. RandInt(_____, _____, _____)

        i. All orange =

        ii. White & orange =

        iii. Orange & black =

    b. In a sample of 5 fish how many would you expect to be each color?

        i. all orange _____, white & orange _____, orange & black ____

    c. Simulations 1 Results: _____

        i. Number of fish that are all orange _____, white & orange _____, orange & black ____

d. Simulation 2 Results: _____

     i. Number of fish that are all orange _____, white & orange _____, orange &

     black _____

15) A spinner is divided so that 20% is red, 10% is blue, and 70% is yellow. I assign the digits 0 and 1 to red, 2 to blue and 3-9 to yellow and type in the command: RandInt(0, 9, 12) and get the following numbers:

     9, 0, 5, 9, 4, 3, 7, 7, 5, 1, 0, 6

    a. Based on the numbers shown from the simulation, how many times did the spinner land on:

      i. Red _____

      ii. Blue _____

      iii. Yellow _____

    b. Calculate the percent each color made up of your sample of 12 spins.

      i. Red _____

      ii. Blue _____

      iii. Yellow _____

<u>**Statistic Review Part 2**</u>

A researcher gathers data on how long teenagers spend on individual cell phone calls (in number of minutes). Suppose the research determines that these calls have a mean 10 min. and standard deviation 7 min.

a.   Suppose the researcher also claims that the distribution of the call lengths follows a normal distribution. Label your horizontal axis with the mean and the values 1, 2 and 3 standard deviations above and below the mean.
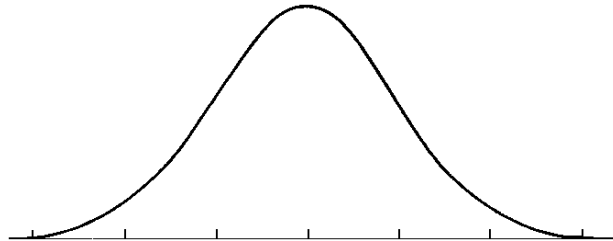
b.   Using your graph, shade the area that represents the probability that a randomly selected call lasts more than 12 min. As your estimate, is this probability closer to 0.50 or to 0.05? Why?

c.   Calculate the probability a randomly selected call will last:
i.   Less than 4 minutes.
ii.   Between 4 and 13 minutes.
iii. More than 13 minutes.

d.   Would the z-score for a call lasting more than 22 minutes be negative or positive? Why?

2.   Use the z-tables to find the probability of:

a.   z < -1.24

b.   z > -1.24

c.   z < 2.08

d.   z > 2.08

e.   -1.24 < z < 2.08

3. A Gallup poll conducted July 10–14, 2013 asked a random sample of U.S. adults: "How much attention do you pay to the nutritional information that is printed on restaurant menus or posted in restaurants, including calories and sugar and fat content." The sample results were that 43% of the respondents said they pay a "fair amount" or a "great deal" of attention. Suppose there had been 500 people in the study.

The following graph displays the results from 1,000 random samples (each with sample size 500) from a very large population where 50% of respondents "pay some attention" and 50% "pay little or no attention."

← sample proportion →
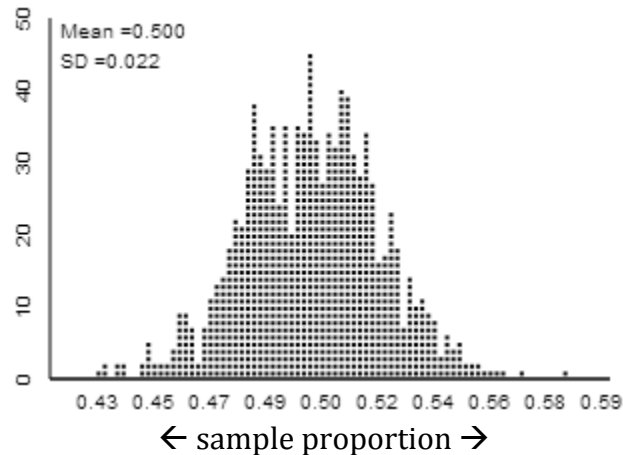
a. Based on the simulation results above, are the sample data (43% responding "pay some attention") consistent with the simulation? In other words, do these results cause you to question whether the population is 50/50 on this issue? Explain.
b. Do you believe it is reasonable to generalize the results from this study to all U.S. adults? Explain.

4. The incubation time for chickens until eggs will hatch is normally distributed with mean 21 days and standard deviation of approximately 1 day. Use the Empirical Rule to estimate the following:

a. The percent of chicken eggs that will hatch between 20 and 22 days.
b. The percent of chicken eggs that will hatch between 19 and 23 days.
c. The percent of chicken eggs that will hatch between 18 and 24 days.
d. The percent of chicken eggs that will take more than 23 days to hatch.
e. The percent of chicken eggs that will take less than 20 days to hatch.

5. Daren wears a Fitbit and tracks his sleeping patterns for a month and find that he sleeps an average of 8 hours a night with a standard deviation of 15 minutes.

a. What is the probability that he will sleep less than 7.5 hours tonight?

b. What is the probability that he will sleep more than 8 hours tonight?

c. What is the probability that he will sleep more than 9 hours tonight?

6. There is a Quinnipiac University poll that surveyed 3000 voters and asked them who they would

vote for in the next election. 53% of the voters surveyed said they would vote for candidate A. The margin of error for the poll was 5%.

   a. What is the estimate for the poll?
   b. What is the margin of error for the poll?
   c. What is the interval for the poll?

7. A carnival game involves spinning a wheel. 10% of the wheel is the grand prize, 40% is a free game and 50% is no prize. How can we use RandInt to simulate 4 spins of the wheel? Explain fully how you are assigning digits and carry out the simulation of 4 spins of the wheel. State the results of your simulation.

8. I type RandInt(1, 4, 10) in my calculator. What do each of the numbers stand for?

9. After a hurricane a disaster area was divided into 200 equal grids. 30 of the grids are selected and every household in the grid is interviewed to help focus relief efforts on what residents require the most.
   a. Is this an example of a census, survey, observational study, or an experiment?
   b. Is this biased or unbiased in finding what residents in hurricane disaster areas require most from relief efforts?

10. The administrators at Ludlowe want to learn about student drinking habits. They randomly select 80 students and call each one to a dean's office and ask them if/how often they drink alcohol. 5% of the students said they drink.
   a. Is this biased or unbiased?
   b. Is 5% a parameter or statistic? Why?
   c. How can the administration get better results?

11. What is the percentage area between a z-score of .43 and a z-score of 1.33?
12. What is the percentage area between a z-score of -1.25 and a z-score of .36?
13. The average man in an industrialized country lives $\mu = 70$ and $\sigma = 6.3$. Use this information to answer problems a – d.
a) What percentage of men live 75 years or longer?
b) What percentage of men live between 65 and 75 years?
c) What percentage of men live 65 years or less?
d) What percentage of men live between 55 and 60 years?

14. Scores of each of the previous English tests were normally distributed with a mean of 72 and standard deviation of 4.3. Gina will be taking the test tomorrow. What is the probability of Gina getting at least 61 on the test?

15. Women heights have a mean of 63.6 in. and a standard deviation of 2.5 inches. Find the z score corresponding to a woman with a height of 70 inches and determine whether the height is unusual.

16. The following table shows the scores of subject 1 on six different scales of an aptitude test. Also shown are the means and standard deviations of these scales.

Test	Mean	Standard Deviation	Score	Z-Score
Clerical Ability	50	15	41	
Logical Reasoning	40	4	47	
Mechanical Ability	120	25	100	
Numerical Reasoning	100	10	105	
Spatial Relations	70	20	90	
Verbal Fluency	60	6	70	

a) Calculate the z-scores for each.
b) On which test did subject 1 score the highest? Which did subject 1 score the lowest?

17. Use the Empirical Rule to find the following: The lifetime of light bulbs of a particular type are normally distributed with a mean of 100mmHg and a standard deviation of 6 mmHg. What percentage of 18-year-old women have a systolic blood pressure between 88 mmHg and 112 mmHg?

Vocabulary:
Population -> Parameter
Sample -> Statistic
Census
Bias
Lurking Variable
Simulation
Observational Study
Survey
Experiment
Subjects   Treatments   Response Variable

Random Selection vs Random Assignment
Random Selection   **Random Assignment**
Is the process of selecting subjects   Is the process of assigning subjects to treatments

Probability Vocab and Symbols:
Union …U
Intersection …∩
Complement …A^c
Sample Space …S
Independence
Conditional Probability

Sequences and Series

1. Tell whether the sequence is arithmetic, geometric or neither.
If its geometric give the common ratio and if its arithmetic give the common difference.

      a. -1, 2, 5, 8, …..

                                                b. 10, 25, 50, 85,…..

sequence type: sequence type:
common ratio/diff (if possible):   common ratio/diff (if possible):

      c. -3, 12, -48,…..

                                                d. 2, 5, 10, 17, ……

sequence type: sequence type:
common ratio/diff (if possible):   common ratio/diff (if possible):

      e. 18, 15, 12, 9,……

sequence type:
common ratio/diff (if possible):

2. Write a rule for the sequence. Find the 7th term of each sequence.

      a. -2, 2, 6, …….   b. $\dfrac{1}{30}, \dfrac{3}{60}, \dfrac{5}{90}, …$

rule: rule:

7th term: 7th term:

                                        $24, -18, \dfrac{27}{2}, -\dfrac{81}{8}, …..$

      c. 21, 14, 7, ……   d.

rule: rule:

7th term: 7th term:

3. Write the series using summation notation.

a. $2 + 5 + 8 + 11$

b. $4 + 8 + 16 + 32 + 64 + 128$

4. Find the sum of the following series:

a. $\sum_{x=1}^{12} x - 6$

b. $\sum_{n=1}^{10} 2(.5)^{n-1}$

c. $\sum_{n=1}^{4} n^2 - 1$

c. $\sum_{n=1}^{6} 2(\frac{2}{3})^{n-1}$

5. Write a rule for the nth term of the arithmetic sequence with a common difference of (-7) and seventh term of 40.

6. Write a rule for the arithmetic sequence with $a_4 = 20$ and $a_9 = 35$.

7. Write a rule for a geometric sequence where $a_4 = 12$ and the r = 3

8. Find the sum of the infinite Geometric sequence.

$\frac{2}{3} + \frac{2}{5} + \frac{6}{25} + \frac{18}{125} + \frac{54}{625} + \ldots$