MA172 Final Exam Review Packet Spring 2018

1. On her first physics test, Honor scored a 72. On her second test, she scored a 68. What grade must Honor earn on her third test to have a test average of an 80?

2. Suppose your students took a test and you calculated the following averages: the mean is 80; the median is 84; the mode is 82. Tom scored an 80 and asks if he did better than half the class. What is your response?

3. On two exams, Megan scored as follows. The class means and standard deviation are also given. On which exam, if either, did she perform better when compared to her classmates?

	Exam 1	Exam 2
Megan	89	76
Mean	77	61
Standard Deviation	6	5

4. A traffic light is red for 60 seconds, yellow for 8 seconds, and green for 40 seconds. What is the probability that when you reach the light, it is green?

5. The letters in the word PARALLELOGRAM are placed on cards. Patty draws a card without looking.

    a. List the possible outcomes.

    b. Are the outcomes equally likely? Explain.

    c. What is the probability that the letter chosen is P?

    d. What is the probability that the letter chosen is J?

    e. What is the probability that the letter chosen is A, E, or O?

    f. What is the probability that the letter chosen is not R?

    g. If you are told that the letter chosen is a vowel, what is the probability that it is an E? (In other words, given the letter chosen is a vowel, what is the probability that it is an E?)

6. Two boxes contain Scrabble tiles. One box contains the letters J, O, B and the second box contains the letters C, U, P. An experiment consists of picking one letter from the first box, writing it down, and then picking a letter from the second box and writing it down.

    a. List all the elements of the sample space.

b. What is the probability of picking two consonants?

c. What is the probability of picking at least one vowel?

7. A couple wants to have exactly three children. Find the probability that the family has:

   a. At least one boy.

   b. Either three boys or three girls.

8. The Math Club consists of 9 people. How many ways can a president, vice-president, and secretary be chosen in this club?

9. The odds in favor of Buffy winning her Martial Arts competition are 9:4. Find the probability that Buffy wins.

10. An experiment consists of choosing two balls, without replacement from a box containing 5 white balls and 4 black balls.

    a. Draw a tree diagram and label the branches with their probabilities.

    b. What is the probability of choosing two white balls?

    c. What is the probability of choosing at least one black ball?

11. A shipment of calculators contains 12 that work and 6 that do not. An inspector selects two at random.

    a. How many ways are there to choose two radios from the shipment?

    b. How many ways are there to choose two functioning radios from the shipment?

    c. What is the probability that the inspector chooses two functioning radios?

12. The following list shows the retirement ages of 15 teachers who retired from ABC middle school.

    62 67 71 54 48 52 46 60 59 57 55 55 56 60 63

    a. Make a stem-and-leaf plot of the data.

b. Summarize in words what the stem-and-leaf plot indicates about the retirement age.

c. Make a histogram of the same data.

13. Construct a set of numbers for which the mean and median are 5.5 and the mode is 4.

14. A class of 23 students had a mean of 78 on a math test. The 10 boys in the class had a mean of 76.2. What was the mean of the girls' test scores?

15. A class has 8 students with heights in inches as follows: 60, 62, 64, 66, 68, 68, 70, and 72.

    a. Find the mean and median of the heights.

    b. Suppose that a basketball recruit who is 86 inches tall joins the class. Find the new median and mode.

    c. Which "average" changed more because of the new student?

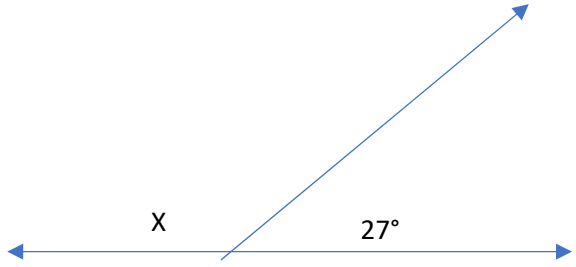
16. Find the supplement of the given angle:

    a. 60°

    b. 14°

    c. 153°

    d. 87°

    e. 

17. Find an angle whose supplement is 60 less than twice the angle.

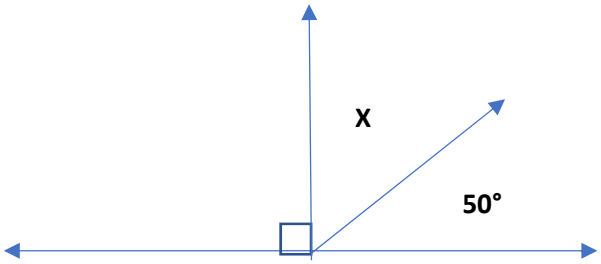
18. Find the complement of the given angle:

    a. 40°

    b. 74°

    c. 100°

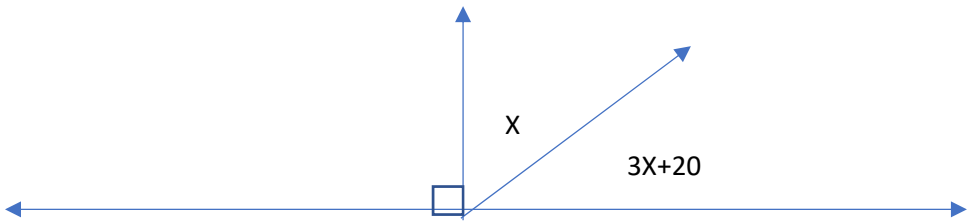
    d.



19. The obtuse angles in this parallelogram measure 137° each. What is the angle measure of each acute angle?

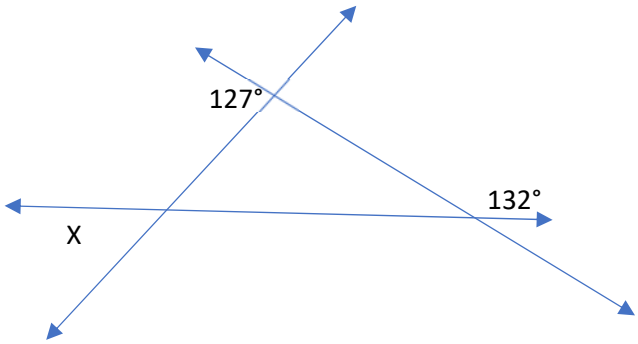
20. In this trapezoid, the acute angles measure 75°each. What is the angle measure of each obtuse angle?

21. Find the missing angles in the image below.

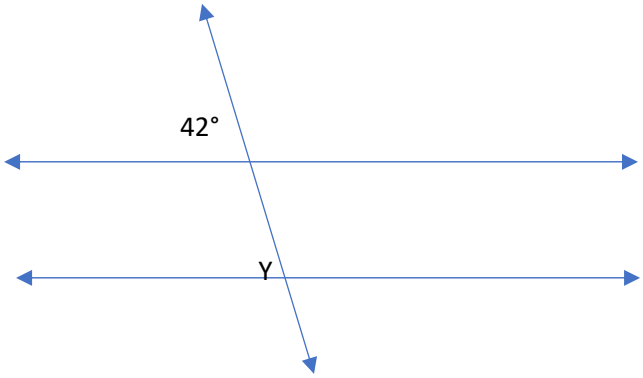


22. Find the missing angles in the images below:

a.

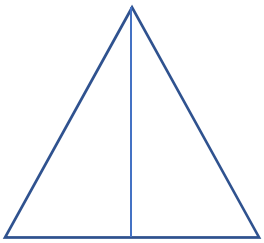


b.

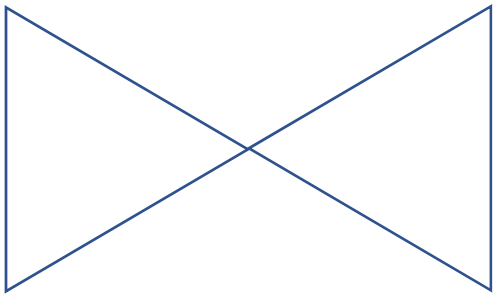


23. Identify how the following triangles could be congruent using SSS, SAS, ASA, AAS, or Not Congruent.

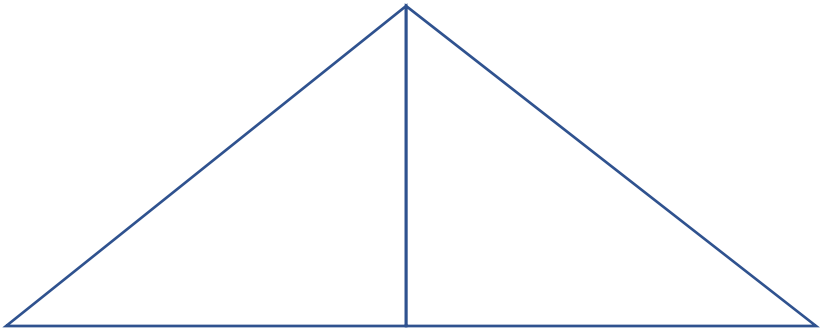
a.



b.



c.



24. Match the following phrase to the probability that describes it.

a. A certain event _____	i. 1/100000
b. An impossible event _____	ii. ¾
c. A 75% chance _____	iii. 1
d. An unlikely event _____	iv. 0

25. When rolling a die twice, what is the probability that the first roll will yield a number greater than three and the second roll will be a number that evenly divides into thirty?

26. A jury of 12 is to be selected from 15 eligible jurors. How many different juries are possible?

27. XYZ Company employs 30 people of the following ages:

24 61 67 40 43 23 34 45 22 32 39 25 46 28 50

42 29 32 59 46 29 33 36 44 23 29 49 27 39 30

a. Draw a stem-and-leaf plot for this set of data.

b. Are there more employees in their 20s or in their 40s?

c. How many employees are more than 32 years old?

28. Answer the following questions using the aspects of a six-sided die and a normal two-sided coin.

a. What is the sample space if both events are done at the same time?

b. What is the probability of rolling a number greater than five or having the coin land on heads?

c. What is the probability of rolling a two and the coin landing on heads?

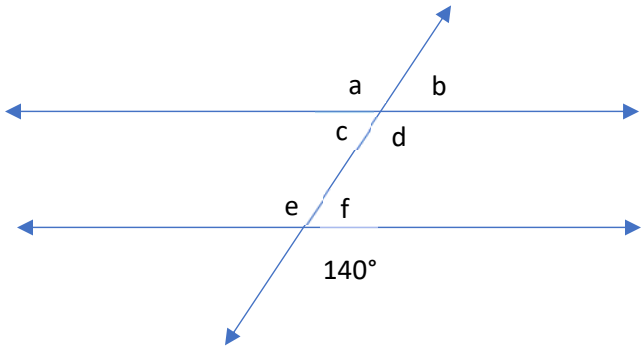
29. Fill in the blank with the word *All, Some,* or *No.* Words may be used more than once or not at all.

a. _____ squares are rectangles

b. _____ triangles are equilateral

c. _____ trapezoids are polygons

30. Given the angle measures indicated on the figure, find the measures of the angles identified by *a, b, c, d, e,* and *f.*



a. $m(\angle a)=$

b. $m(\angle b)=$

c. $m(\angle c)=$

d. $m(\angle d)=$

e. $m(\angle e)=$

f. $m(\angle f)=$

31. Determine whether $\Delta ABC \cong \Delta DEF$ under the following conditions. **Sketch a drawing** that illustrates the conditions. If the triangles are congruent**, indicate the property of congruence** that applies.

a. $\overline{AB} \cong \overline{DE}$ and $\overline{AC} \cong \overline{DF}$ and $\angle C \cong \angle F$

b. $\overline{AC} \cong \overline{DF}$ and $\angle A \cong \angle D$ and $\angle C \cong \angle F$

c. $\angle B \cong \angle E$ and $\overline{AB} \cong \overline{DE}$ and $\overline{BC} \cong \overline{EF}$

32. A new department store opens on a hot summer day. Kathy's job is to stand outside and hand out coupons to incoming customers. The building is 30 ft tall and casts a shadow 8 ft long in front of the store. If Kathy is 5 ft tall, how far from the end of the shadow can she stand and still be in the shade? Do not round your answer.

33. Determine whether the following statements are true or false.

    a. The lines $3y = 6x - 9$ and $y = 2x + 7$ are parallel lines. _____

    b. Any two lines will intersect at exactly one point. _____

    c. A vertical line has an undefined slope. _____

34. Answer the following questions:

    a. State the slope and y-intercept of the given linear equation.

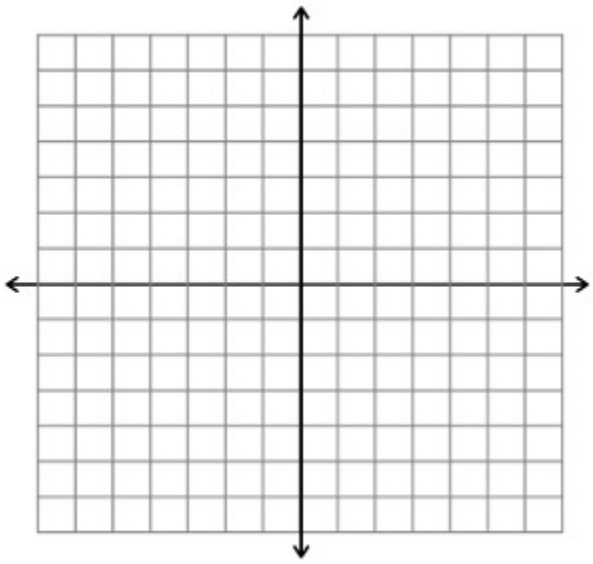
    $4x - 6y = 12$

    b. State the slope of a line which is perpendicular to the line given in part (a).

    c. Determine the equation of the line perpendicular to the line in part a going through the point $(0, 6)$.

35. Write the equation of the line going through the points (-2, -15) and (1, -3).

36. Solve the system of equations graphically.



$3x - 2y = -6$

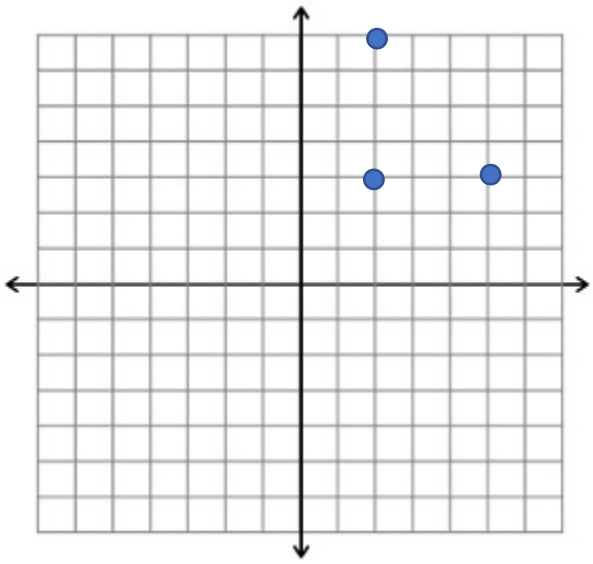
$y = -x + 3$

37. Solve the system of equations by either substitution or elimination.

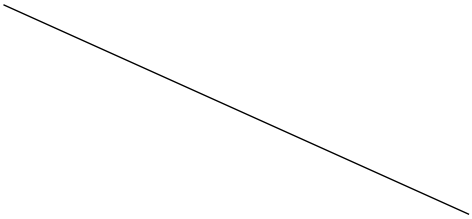
$2x + 3y = 11$

$4x - 3y = -5$

38. Alissa plotted the first three corners of a rectangle on the grid below. Determine the coordinates of the fourth corner.



39. **Construct** and **define** the perpendicular bisector of the following line segment.



40. Sketch a circle and rectangle that intersect in exactly three points.

41. Sketch an obtuse scalene triangle.

42. A student says that a vertical line has an infinite slope. How do you respond?

43. What is the measure of an angle whose degree is five times its complement? (Hint: Draw a picture!)

44. What is the measure of each interior vertex angle in a regular hexagon?

45. Find the length of the side of a square with the same perimeter as the circumference of a circle with radius 6 in. Use 3.14 for π.

46. Make the following conversions:

    a. 4 ft = _____ in

    b. 790 cm= _____ km

c. 45 L = _____ Kl

d. 720 in = _____ ft

e. 8200 m = _____cm

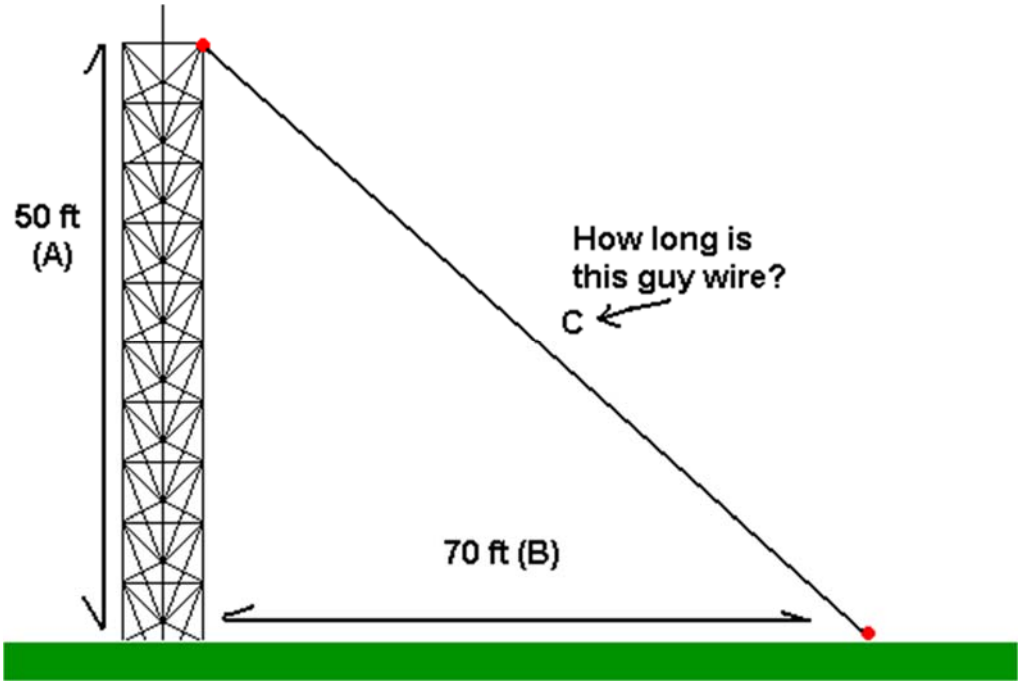
f. 65000 mm = _____ cm

47. Determine whether each set of lengths could form a right triangle, an acute triangle, an obtuse triangle, or no triangle.

a. 6, 8, 10

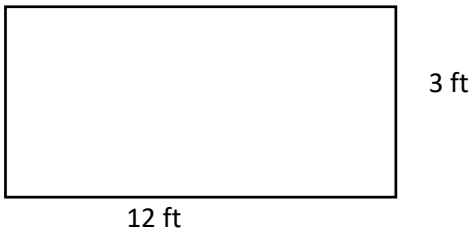
b. 1, 2, 4

48. A cell tower is 50 ft tall. A guy wire is attached to offer support. If the base of the wire is put into the ground 70 ft away from the tower, how long is the guy wire? (The term "guy wire" is derived from the word "guy," which means a rope or wire used to guide or steady an object being hoisted or lowered into position. It comes from the Old French word "guier," meaning "to guide.") **Round your answer to the nearest hundredth.**

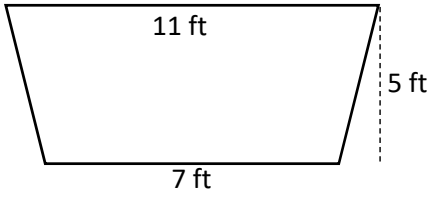


49. Find the exact area of a circle with a circumference of 26π in.

50. Find the perimeter of the following object.



51. Find the area of the following object.



52. Sketch a right circular cylinder. Determine the volume of the object with height 5 in and diameter 2.4 in. Round your answer to the nearest tenth of a unit.

53. Sketch a square pyramid.

a. Determine the number of faces. _____

b. Determine the number of edges. _____

c. Determine the number of vertices. _____

d. Determine the volume of the object with a height of 6 m and base side length of 4 m.

54. Sketch a right rectangular prism. Determine the surface area of the object with dimensions 6 in, 2 in, and 9 in.

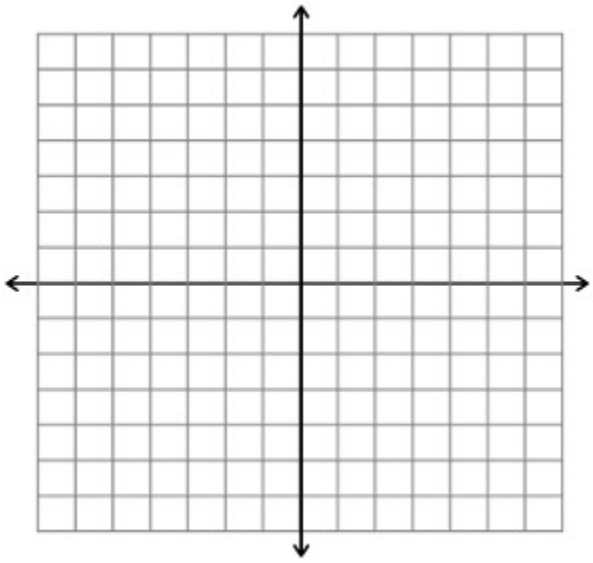
55. Find the distance between (4, 6) and (-2, 8).

56. Use the equation $(x-1)^2+(y+2)^2=16$ to calculate the following:

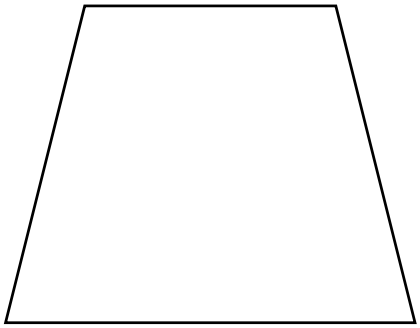
a. Identify the center and radius of the given circle.

b. Determine one point which lies on the circle.

c. Sketch the graph of the circle.



57. Discuss the isosceles trapezoid pictured below in terms of the three symmetries. Explain.



1

2

3

58. Answer the following questions:

a. Sketch a regular hexagon. Include all the lines of symmetry.

b. Determine the measure of each vertex angle.

c. Determine the measure of each central angle.

d. True or false: The hexagon in part (a) has rotational symmetry. Explain your response.

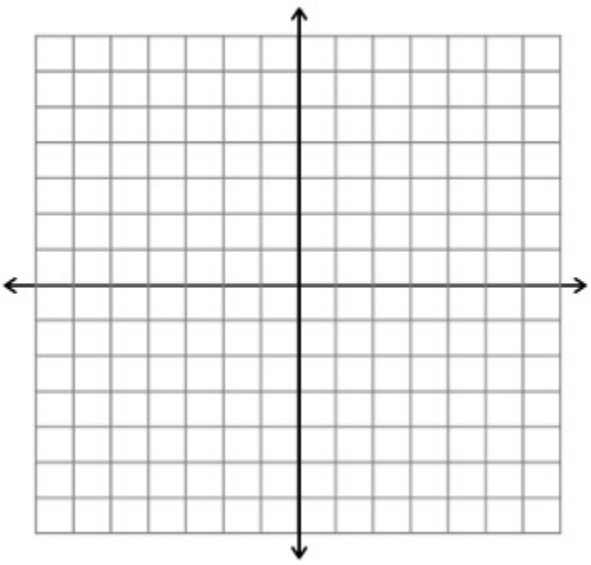
59. Given points A(3, -6) and B(-2, 5), find the coordinates of the following:

a. The image of A after the translation defined by $(x, y) \rightarrow (x-5, y+3)$.

b. The image of A after a rotation 90° counterclockwise about the origin.

c. The image of B after it is reflected over the line $y = x$.

d. The image of B after a size transformation with the center at the origin and scale factor of 3.

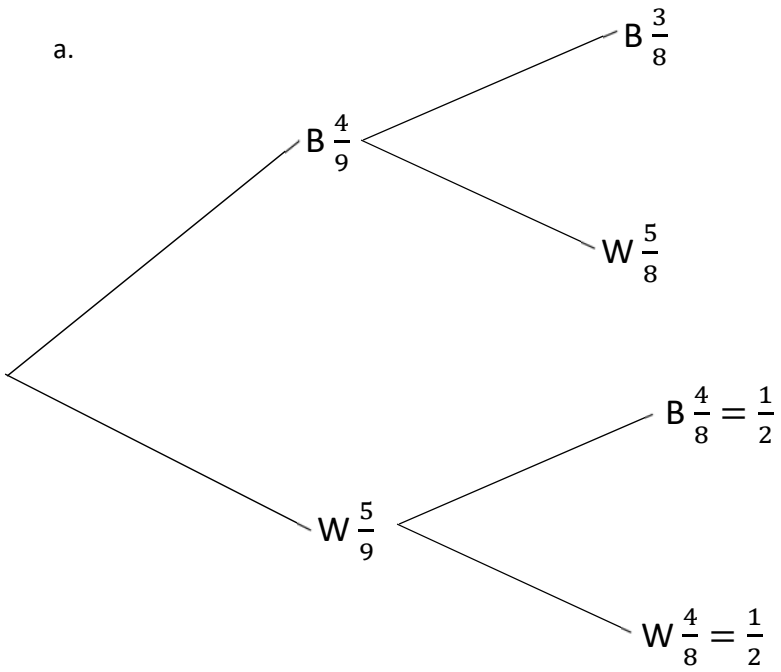


60. Sketch a simple, convex, closed curve.

61. Sketch a complex, concave curve.

MA172 Final Exam Review Answer Sheet

1. 100
2. Answers may vary.
3. Exam 2
4. $\frac{2}{3}$ or 0.67
5.
    a. P, A, R, L, E, O, G, M
    b. No; some letters have duplicates and so are more likely.
    c. $\frac{1}{13}$
    d. 0
    e. $\frac{5}{13}$
    f. $\frac{11}{13}$
    g. $\frac{1}{5}$
6.
    a. {J, C}, {J, U}, {J, P}, {O, C}, {O, U}, {O, P}, {b, C}, {B, U}, {B, P}
    b. $\frac{4}{9}$
    c. $\frac{5}{9}$
7.
    a. $\frac{7}{8}$
    b. $\frac{1}{4}$
8. 504 ways
9. $\frac{9}{13}$
10.
    a.

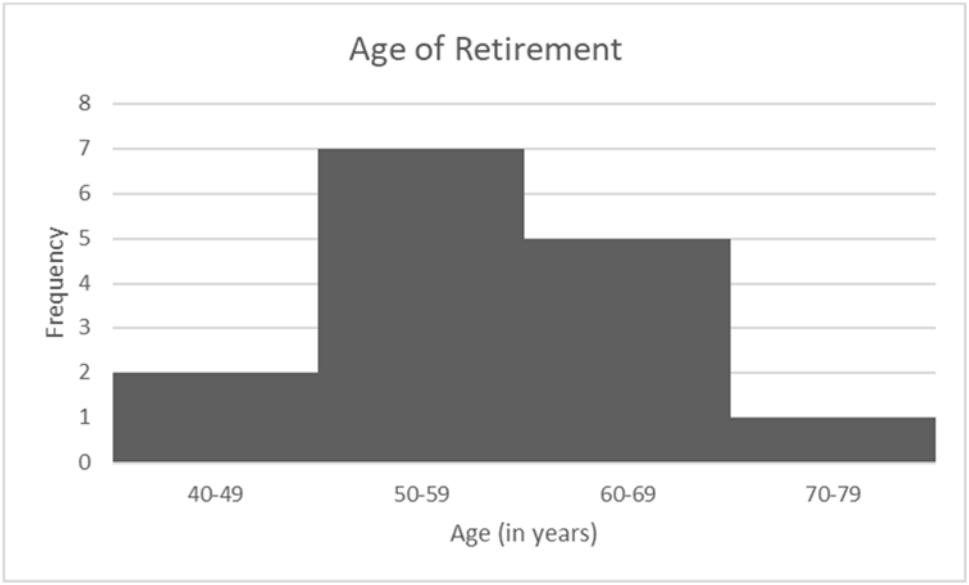


11. G
    a. 153 ways
    b. 66 ways
    c. $\frac{22}{51}$
12. G

Key: 4|6 =46

4	6 8
5	2 4 5 5 6 7 9
6	0 0 2 3 7
7	1

    a.
    b. Most teachers at ABC Middle School retire in their 50s.
    c.



13. Answers may vary. One possibility: {4, 4, 4, 5.5, 6, 7, 8}
14. 79.8
15.
    a. Median = 67 inches
       Mean = 66.25 inches
    b. Median = 68 inches
       Mean = 68.4 inches
    c. The mean changed more; it is *elastic* where the median is *inelastic*.
16. C
17. $40°$
18. A
19. $43°$
20. $105°$
21. $17.5°, 72.5°$
22.
    a. $x = 79°$
    b. $y = 42°$

23.

a. ASA
b. Not congruent
c. ASA

24.

a. iii
b. iv
c. ii
d. i

25. $\frac{5}{12}$

26. 455 ways

27.

Key: 2|2=22

2	2 3 3 4 5 7 8 9 9 9
3	0 2 2 3 4 6 9 9
4	0 2 3 4 5 6 6 9
5	0 9
6	1 7

a.
b. 20s
c. 17 employees

28.

a. {1, H}, {2, H}, {3, H}, {4, H}, {5, H}, {6, H}, {1, T}, {2, T}, {3, T}, {4, T}, {5, T}, {6, T}
b. $\frac{2}{3}$
c. $\frac{1}{12}$

29.

a. No
b. Some
c. All

30.

a. $140°$
b. $40°$
c. $40°$
d. $140°$
e. $140°$
f. $40°$

31.

a. Not congruent
b. ASA
c. SAS

32. $1\frac{1}{3}$ feet

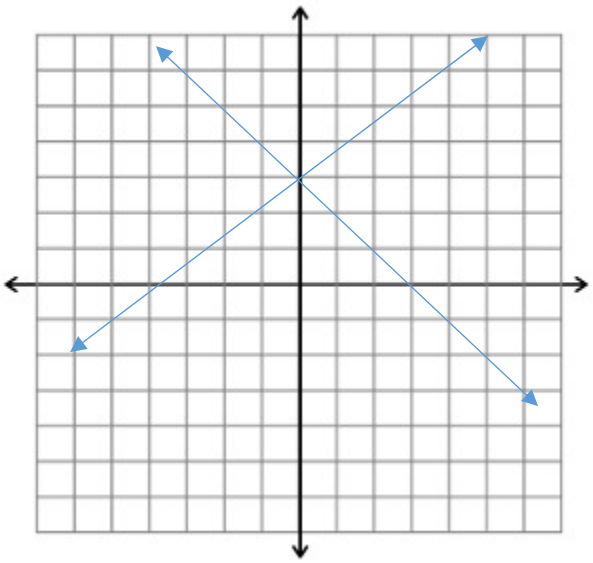
33.

a. True
b. False
c. True

34. F

a. $m = \frac{2}{3}, y - intercept = (0, -2)$
b. $m = -\frac{3}{2}$
c. $y = -\frac{3}{2}x + 6$

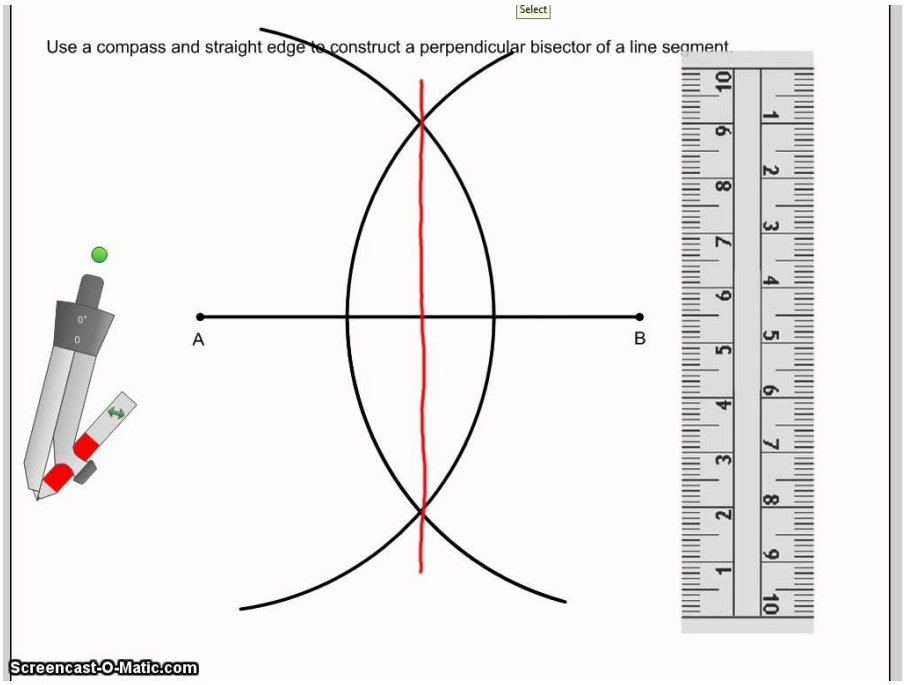
35. $y = -4x - 7$



36. Solution: (0, 3)

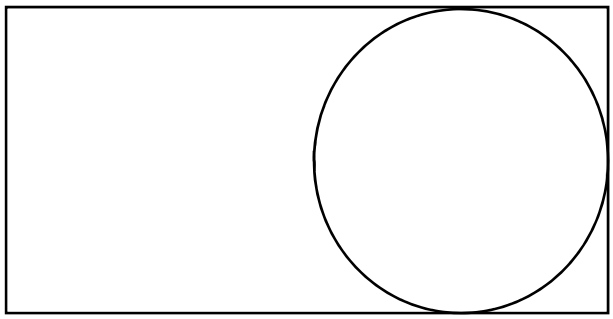
37. (1, 3)

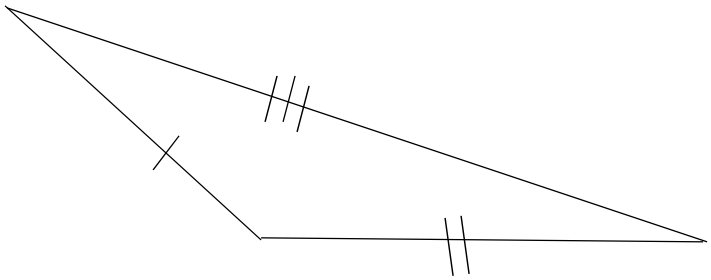
38. (5, 7)



39.

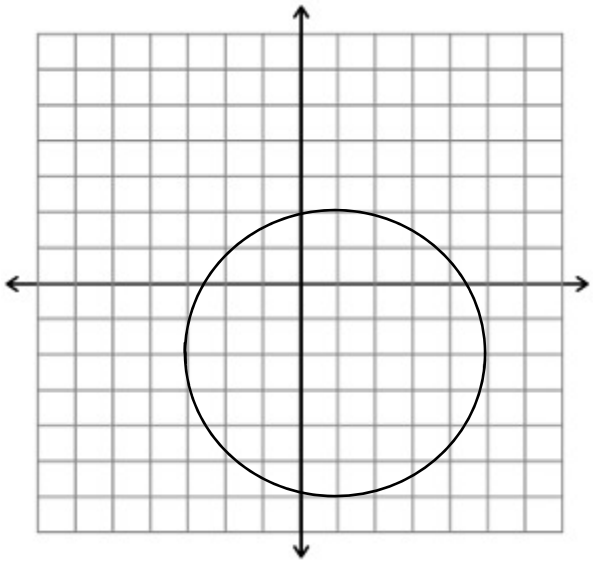
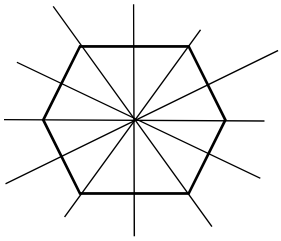
40. F

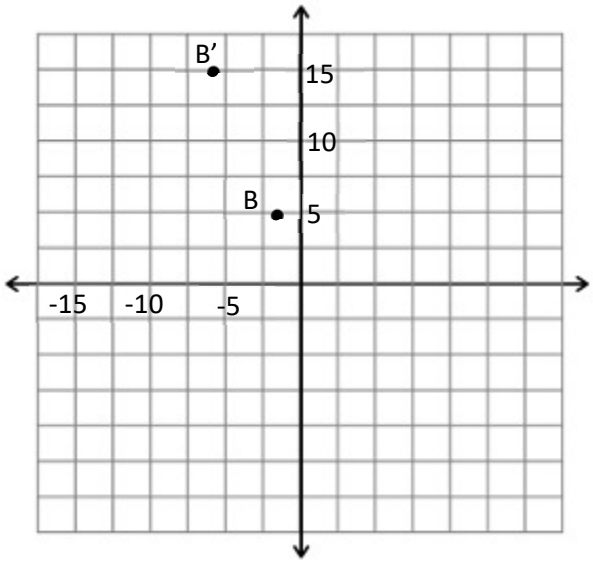




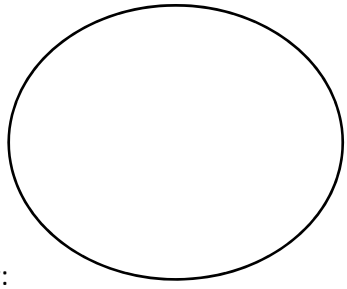
41.

42. Answers may vary; Basic idea: When you determine the slope mathematically, you end up with a zero on the bottom, or dividing by zero. The answer then is “undefined,” not infinity.
43. $x = 75°$
44. $120°$
45. 9.42 inches
46.
    a. 48 in
    b. 0.0079 km
    c. 0.045 kL
    d. 60 ft
    e. 820,000 cm
    f. 6,500 cm
47.
    a. Right triangle
    b. Not a triangle
48. 86.02 ft
49. $169\pi\ in^2$ (or square inches)
50. 30 ft
51. $45\ ft^2$ (or square feet)
52. $37.7\ in^3$ (or cubic inches)
53.
    a. 5
    b. 8
    c. 5
    d. $32\ m^3$
54. $168\ in^2$
55. $2\sqrt{10}$

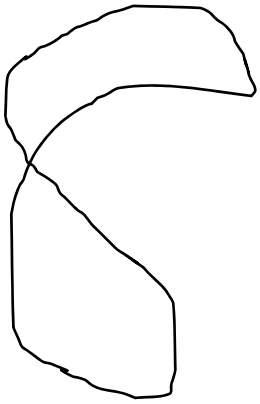
56. F
    a. Center = (1, -2), r=4
    b. Answers may vary; one possibility: (5, -2)
    c. 
57. Line symmetry – only vertically down the center of the trapezoid
    Point symmetry – none
    Rotational symmetry – none
58.
    a. 
    b. $120°$
    c. $60°$
    d. True; any rotation will result in the same shape.
59. F
    a. (-2, -3)
    b. (-6, -3)
    c. (5, -2)



d.



60. Answers may vary; one possibility:



61. Answers may vary; one possibility: