

**Directions:** You have the entire lecture period to complete this exam. Each answer is worth 1 point.

1. What is the ratio of the **circumference** to the **radius** of any circle? \_\_\_\_\_
2. Write a definition of an acute angle: \_\_\_\_\_
3. How many lines of symmetry will a regular hexagon have? \_\_\_\_\_.
- 4-5. State two different Pythagorean triples using the number 12. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
6. The name for a ten-sided polygon is: \_\_\_\_\_.
- 7-8. Name two different types of symmetry: \_\_\_\_\_ and \_\_\_\_\_.

Plane or Euclidean Geometry begins with three basic undefined terms. These terms are:

9. \_\_\_\_\_ 10. \_\_\_\_\_ 11. \_\_\_\_\_

Name the three geometric shapes in Tangram pieces.

12. \_\_\_\_\_ 13. \_\_\_\_\_ 14. \_\_\_\_\_

Name the three regular polygons that tessellate.

15. \_\_\_\_\_ 16. \_\_\_\_\_ 17. \_\_\_\_\_

Give the common or "slang" words for the following mathematical terms.

18. reflection \_\_\_\_\_ 19. translation \_\_\_\_\_ 20. rotation \_\_\_\_\_

21. If the measure of an angle is 42 degrees, what is the measure of its complement? \_\_\_\_\_
22. If two sides of a triangle are 6 and 12, what is the **largest** whole measure that the third side could be? \_\_\_\_\_
23. For a figure to be "golden" the length to width ratio must be: \_\_\_\_\_
24. A geoboard contains how many pegs/points (total)? \_\_\_\_\_

For problems 25 & 26 draw a figure that meets the specifications. (more than one answer possible)

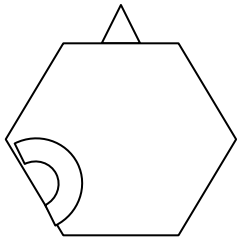
25. Sketch an example of a simple, closed concave hexagon.
26. Sketch an example of a not-simple, closed, concave figure that is not a polygon.

Use the following figures to answer questions 27 and 28.

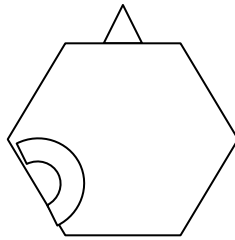
27. On figure 30, sketch the alterations you would get using slide translations.

28. On figure 31, sketch the alterations you would get using rotation about the vertices marked.

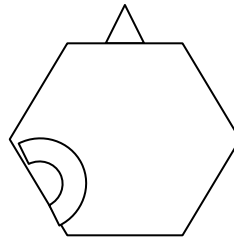
original figure



27.



28.



Your fourth-grade class is studying geometry.

29. A student, seeing the regular hexagon, remarks that if all the angles are congruent, then the sides must be congruent, is most likely at what Van Hiele level? \_\_\_\_\_

30. Another student always refers to a regular hexagon as a "stop sign." This child is most likely at what Van Hiele level? \_\_\_\_\_

31. Another student describes the hexagon as regular, but seems confused when you point out that squares are also regular, is most likely at what Van Hiele level? \_\_\_\_\_

32. Another student can explain logically why the vertex angles are  $120^\circ$ . This child is most likely at what Van Hiele level? \_\_\_\_\_

**True/False:** Circle your choice. (For a statement to be true, it must *always* be true.)

T F 33. All squares are similar.

T F 34. For any line  $AB$  and point  $C$  on  $AB$ , there is only **one** plane containing both  $C$  and line  $AB$ .

T F 35. If a plane contains a point on a line, then the plane must contain the entire line.

T F 36. If a triangle is scalene, then it cannot be obtuse.

T F 37. If a parallelogram has a right angle, it must be a square.

T F 38. A quadrilateral with one pair of adjacent sides congruent must be a kite.

T F 39. A polygon with opposite sides parallel must be a parallelogram.

T F 40. If a polygon is equiangular, then it must be equilateral.

A biased coin is tossed twice. Assume the probability of Heads is  $1/3$  and probability of Tails is  $2/3$ .

41. In the space to the right, draw the probability tree diagram for this experiment, and label the probability on each branch.

42. Are the trials of the experiment of tossing a biased coin dependent? \_\_\_\_\_

43. Are the outcomes of tossing a biased coin mutually exclusive? \_\_\_\_\_

Use your tree diagram to answer the following.

44. Find  $P(\text{getting exactly one Head})$

45. Find  $P(\text{both tosses get same outcome})$

46. Find  $P(\text{not getting a Head})$

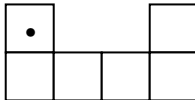
47. Find  $P(\text{getting at least one Head})$

Use **one regular 6-sided dice** to answer questions 48 & 49.

48. Give an example of events that are mutually exclusive. \_\_\_\_\_

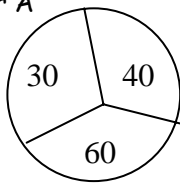
49. Give an example of events that are not mutually exclusive. \_\_\_\_\_

50-51. State two things wrong with the dice net shown below. \_\_\_\_\_

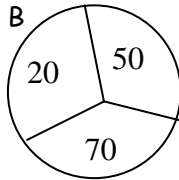


52-53. In spinners lab, two players simultaneously flicked two spinners and the spinner landing on the higher number won. Complete the chart to determine which of the following spinners would theoretically win.

Spinner A



Spinner B

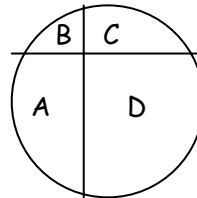


Spinner A

Spinner B


Which spinner would theoretically win? \_\_\_\_\_

54. Given the following spinner, which letter would theoretically occur the most? \_\_\_\_\_



Given this small data set: 9, 4, 10, 1, 6 find the following:

55. mean = \_\_\_\_\_

56. median = \_\_\_\_\_

57. mode = \_\_\_\_\_

58. range = \_\_\_\_\_

59. standard deviation = \_\_\_\_\_

60. the first quartile = \_\_\_\_\_

61. the third quartile = \_\_\_\_\_

62. Sketch a box-and-whisker plot for the data set above using the numbers below as a guide for the plot.

0      1      2      3      4      5      6      7      8      9      10      11

Given the stem-and-leaf chart for a set of quiz scores:

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

63. How many pieces of data are represented in the stem-and-leaf chart? \_\_\_\_\_

64. What is the median score? \_\_\_\_\_

65. What is the mode? \_\_\_\_\_

66. If a passing grade on the quiz is half of the questions correct (i.e. 20 correct out of 40 possible points), how many students passed? \_\_\_\_\_

*Given the metric symbol, state the corresponding metric unit and state what is being measured.*

67-68. m      \_\_\_\_\_      \_\_\_\_\_

69-70. kg      \_\_\_\_\_      \_\_\_\_\_

71-72. /      \_\_\_\_\_      \_\_\_\_\_

*Give the metric prefix for.*

73. one-thousandth \_\_\_\_\_

74. thousand \_\_\_\_\_

*Convert:*

75. 0.25 km = \_\_\_\_\_ cm

76. 24,000 mg = \_\_\_\_\_ g

*Given the Customary abbreviation, state the corresponding English unit and state what is being measured.*

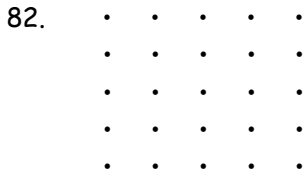
77-78. lb.      \_\_\_\_\_      \_\_\_\_\_

79-80. mi.      \_\_\_\_\_      \_\_\_\_\_

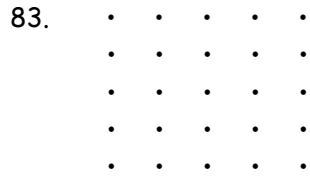
81. What is the international symbol for the metric system? \_\_\_\_\_

Use the Geoboard grids below to draw 2 points each:

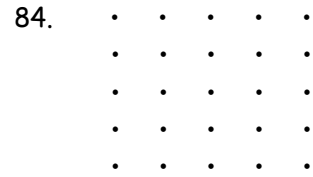
A square with area 2.



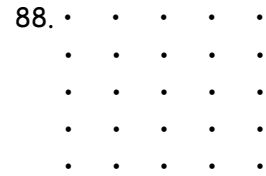
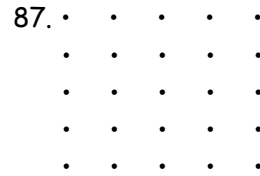
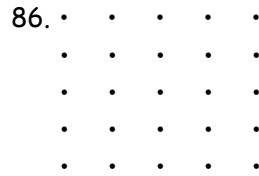
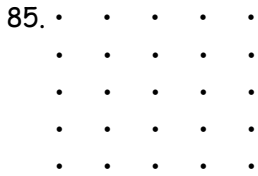
A square with area 10.



A triangle with area 5.



Use the Geoboard grids below to draw 4 **different** polygons with a perimeter of 10 and an area of 4. 2 points each



89. Name two different letters of the alphabet that have vertical symmetry. \_\_\_\_\_ & \_\_\_\_\_

90. Name two different letters of the alphabet that have horizontal symmetry. \_\_\_\_\_ & \_\_\_\_\_

91. Name two different letters of the alphabet that have point symmetry. \_\_\_\_\_ & \_\_\_\_\_

92-93. Draw a diagram and explain how to use patty paper or a mira to find a perpendicular to a line from a point not on the line. (You must start with a line and a point not on the line)