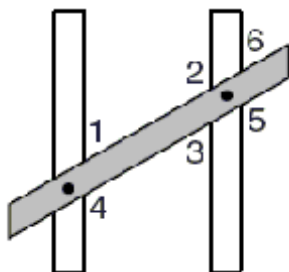


Name \_\_\_\_\_

- 1) An equilateral triangle is placed on top of a square to form a pentagon. If you take away the line shared by the triangle and the square, what is the largest angle inside the pentagon?
  - A) 108 degrees
  - B) 60 degrees
  - C) 90 degrees
  - D) 150 degrees
  - E) not enough information
- 2) A circle is inscribed in a square. The radius of the circle is 9cm. What is the perimeter of the square?
  - A) 81cm
  - B) 324cm
  - C) 72cm
  - D) 36cm
  - E) 18cm
- 3) You are given a piece of string. If you use all the string to make a shape, which shape would have the largest area?
  - A) circle
  - B) pentagon
  - C) square
  - D) rectangle
  - E) triangle
- 4) The area of a circle is  $x$  square feet and the circumference is  $y$  feet. If  $x = y$ , what is the diameter of the circle?
  - A) 4
  - B) 1
  - C)  $\pi$
  - D) 2
  - E) None of the above
- 5) If the radius of a circle is 100 meters, how many rotations around the circle must you go to travel 10,000 meters? Round to the nearest whole revolution.
  - A) 16
  - B)  $\pi$
  - C) 21
  - D) 100
  - E) 79
- 6) Banners can be purchased for \$10.00 a yard. UNCP wishes to purchase a banner that will wrap around the education building. From a helicopter view, the building is square and has an area of 8100 square feet. How much will the banner cost?
  - A) \$81000.00
  - B) \$1200.00
  - C) \$3600.00
  - D) \$900.00
  - E) \$300.00
- 7) Which of the following does not describe a distinct circle?
  - A) a center and radius
  - B) two points on the circle
  - C) two endpoints on the diameter
  - D) three points on the circle
  - E) a center and point on the circle
- 8) How many degrees are there in an angle that is one-fifth the measure of its supplement?
  - A) 45
  - B) 150
  - C) 15
  - D) 60
  - E) 30
- 9) Hasbro advertises that their new toy race cars travel on a track at 400 feet per minute. If the circular track has a radius of 5 feet, what is the best approximation of how many times the car will circle the track in 5 minutes?
  - A) 10 times
  - B) 80 times
  - C) 2000 times
  - D) 200 times
  - E) 65 times

- 10) Given:  
 (1) If A is white, then B is red.  
 (2) B is not red.  
 Which of the following must be true?  
 A) A is red.  
 B) A is white.  
 C) B is not white.  
 D) A is not white.  
 E) B is white.
- 11) What is the distance between the points  
 (1,-2,4) and (6,-8,9)?  
 A)  $\sqrt{86}$   
 B)  $\sqrt{43}$   
 C)  $\sqrt{318}$   
 D) 10  
 E) none of these
- 12) The hypotenuse of a triangle is 15 inches and  
 one of the legs is 10 inches. Which of the  
 following cannot be the length of the other leg?  
 A) 5 inches  
 B) 12 inches  
 C) 1 inch  
 D) 20 inches  
 E) all are possible
- 13) Which shape has interior angles adding up to  
 1080 degrees?  
 A) sphere  
 B) hexagon  
 C) decagon  
 D) octagon  
 E) trapezoid
- 14) Two angles of a triangle have measures of 55  
 degrees and 65 degrees. Which of the  
 following could not be a measure of an exterior  
 angle of the triangle?  
 A) 115 degrees  
 B) 125 degrees  
 C) 120 degrees  
 D) 130 degrees  
 E) all can be exterior angles
- 15) Which of the following is the midpoint of  
 (-2,6,10) and (-4,5,3)?  
 A) (1, -11/2, 7/2)  
 B) (-3, 1/2, 7/2)  
 C) (1, 11/2, 7/2)  
 D) (1, 1/2, 13/2)  
 E) (-3, 11/2, 13/2)
- 16) If one angle of an equilateral triangle is  
 bisected to cut the side opposite the angle,  
 what type of triangles are created by the  
 bisector?  
 A) right  
 B) isosceles  
 C) obtuse  
 D) equilateral  
 E) impossible to determine
- 17) Lines m and n are in the same plane. The two  
 lines are not parallel. Which of the shapes  
 below could not be made if m and n are two of  
 the sides of the shapes?  
 A) triangle  
 B) rhombus  
 C) trapezoid  
 D) square  
 E) all are possible
- 18) If  $\overline{AB} \cong \overline{DE}$ ,  $\overline{BC} \cong \overline{EF}$ , and  $\overline{AC} \cong \overline{DF}$ . Which of  
 the following are true?  
 A)  $\triangle ABC \cong \triangle DFE$   
 B)  $\triangle ABC \cong \triangle FED$   
 C)  $\triangle ABC \cong \triangle EFD$   
 D)  $\triangle ABC \cong \triangle DEF$   
 E) all are true

19) Which of the following would not ensure parallel line?



- A)  $m\angle 4 = m\angle 2$
- B)  $m\angle 1 = m\angle 6$
- C)  $m\angle 1 + m\angle 2 = 180$
- D)  $m\angle 4 + m\angle 1 = 180$
- E)  $m\angle 5 + m\angle 1 = 180$

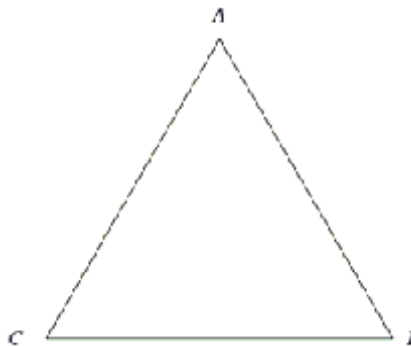
20) Three different lines are in a plane. Which of the following is not a possible number of intersections of the lines?

- A) 3
- B) 1
- C) 2
- D) 0
- E) All are possible

21) Which of the following does not belong with the others?

- A) pentagon
- B) rectangle
- C) parallelogram
- D) square
- E) rhombus

22) In the figure below,  $AB > BC$ .



If we assume that  $m\angle A = m\angle C$ , it follows that  $AB = BC$ . This contradicts the given statement that  $AB > BC$ . What conclusion can be drawn from this contradiction?

- A)  $m\angle A = m\angle C$
- B)  $m\angle A \neq m\angle C$
- C) the triangle is equilateral
- D)  $m\angle A = m\angle B$
- E)  $m\angle A \neq m\angle B$

23) A sheet of paper has dimensions 10 inches by 10 inches. If a square of area 4 square inches is cut out of each corner of the sheet, what is the area of the remaining paper? Give answer in square inches.

- A) 64
- B) 16
- C) 96
- D) 36
- E) 84

24) What is the area of the smallest rectangle that would contain a triangle with base 10 inches and area of 60 inches squared? Give your answer in inches squared.

- A) 120
- B) 240
- C) 80
- D) 40
- E) 60

25) The sum of a set of vertical angles is 36. What is the measure of one of these angles supplement? Answer is in degrees.

- A) 162
- B) 72
- C) 324
- D) 144
- E) 18

- 26) The measures of the interior angles of a pentagon are  $2x$ ,  $6x$ ,  $4x-6$ ,  $2x-16$ , and  $6x+2$ . What is the measure of the largest angle in degrees?
- A) 106
  - B) 170
  - C) 28
  - D) 174
  - E) 166
- 27) A right angle is bisected into angles  $\angle 1$  and  $\angle 2$ . Angle  $\angle 2$  is bisected into angles  $\angle 3$  and  $\angle 4$ . What is the supplement of angle  $\angle 3$ ?
- A) 45 degrees
  - B) 67.5 degrees
  - C) 22.5 degrees
  - D) 135 degrees
  - E) 157.5 degrees
- 28) Assume the three shapes below have the same perimeter. Which shape must have the smallest area?
- A) circle
  - B) a rectangle that is not a square
  - C) square
  - D) given the conditions, all have same area
  - E) cannot be determined with given information
- 29) The supplement of an angle is three times the complement of the same angle. Find the angle.
- A) 30 degrees
  - B) 60 degrees
  - C) 45 degrees
  - D) 225 degrees
  - E) 135 degrees
- 30) What is the measure of an interior angle of a regular octagon?
- A) 150 degrees
  - B) 90 degrees
  - C) 112.5 degrees
  - D) 135 degrees
  - E) 120 degrees
- 31) A college campus is designed in the shape of a square with a main building in each corner of the square. If 500 feet is the closest distance between any two buildings, what is the longest distance between any two buildings? Approximate your answer.
- A) 600 ft
  - B) 900 ft
  - C) 750 ft
  - D) 700 ft
  - E) over a 1000 ft
- 32) A circle of area  $25\pi$  square inches is placed inside a circle of area  $100\pi$  square inches. What is the difference between the diameters of the two circles? Answer in inches.
- A) 20
  - B)  $\pi$
  - C) 10
  - D) 75
  - E) 5
- 33) What is the converse of the statement below? "If a triangle has three acute angles, then it is an acute triangle."
- A) If a triangle does not have 3 acute angles, then it is not an acute triangle.
  - B) If a triangle does not have 3 acute angles, then it is an acute triangle.
  - C) If a triangle is an acute triangle, then it has three acute angles.
  - D) If a triangle is not an acute triangle, then it does not have 2 acute angles.
  - E) none of the above
- 34) The diameter of a circle has endpoints  $(-2,3)$  and  $(6,3)$ . What is the center of the circle?
- A)  $(3,2)$
  - B)  $(0,0)$
  - C)  $(2,3)$
  - D)  $(-3,2)$
  - E)  $(2,4)$

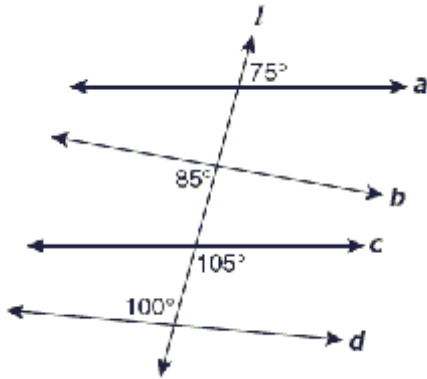
35) Triangles  $\triangle ABC$  and  $\triangle DEF$  are both equilateral. If the length of  $DE$  is twice the length of  $AB$ , then the area of  $\triangle DEF$  is \_\_\_\_\_ the area of  $\triangle ABC$ .

- A) the same as
- B) half
- C) twice
- D) four times
- E) six times

36) If two parallel lines are cut by a transversal, how many sets of vertical pairs do the three lines form?

- A) 6
- B) 3
- C) 8
- D) 4
- E) 2

37) Transversal  $l$  cuts lines  $a$ ,  $b$ ,  $c$ , and  $d$ .



Which two lines are parallel?

- A) b and c
- B) none
- C) a and d
- D) a and c
- E) b and d

38) One face of a cube has a diagonal of 3 inches. Which of the following is closest to the volume of the cube in inches cubed?

- A) 9
- B) 4
- C) 10
- D) 27
- E) 17

39) Given  $\triangle ABC$  and  $\triangle DEF$ . If side  $\overline{AB}$  is placed against side  $\overline{DE}$ , which of the following shapes would be impossible to create?

- A) hexagon
- B) pentagon
- C) triangle
- D) square
- E) all are possible

40) If three linear points are placed in a plane, which figure could not be drawn using the three points?

- A) circle
- B) square
- C) triangle
- D) hexagon
- E) All are possible