Number Problems

1. The perimeter of a triangle is 132cm and the lengths of its sides are in the ratio. Find the length of each side.
2. In the figure with altitude 6, find the measures of x, y, and z

3. In right triangle *ABC,* altitude is drawn to hypotenuse. If , and *AD* exceeds  *DB* by 7, find *DB* and *AD. (Draw a diagram)*

4. In , D is a point on and E is a point on such that . If, , , and, find, , and .

5. In the figure below, lines *l* and *m* are parallel and cut by transversal *k*. Find the measure of all of the angles. *k*

 (7*x* – 65)º 4 *l*

 3 5

 2 6 *m*

 1 (5*x* – 5)º

6a. In rectangle *ABCD*, E is the midpoint of diagonal . Find the measure of .



 b. If , find the length of.

7. In parallelogram *ABCD ,* and  bisects .

 Find and .



8. The larger of two supplementary angles is 20º less than four times the smaller. Find the measure of each angle.

9. The legs of a right triangle measure  and 15. What is the measure of the hypotenuse?

10. What is the equation of a circle with a center of (3,-1) and radius 4?

11. What is the equation of the line that is parallel to the line  and goes through the point (6, -2)?

12. is tangent to circle O at B.  is a chord. Arc BD = . What is the measure of 



13. What is the measure of an interior angle of a regular hexagon?

14. What is the volume of a right circular cone if the radius of the base is 4 and the altitude of the cone is 14? (*Leave answers in terms of )*

15. In right triangle *ABC,* altitude is drawn to hypotenuse. If *CD = 12, and DB = 16*, Find the lengths of AD, AC, and CB.

16. Two triangles are similar the lengths of the sides of the smaller triangle are 7, 8, 11. The longest side of the larger triangle is 33. Find the perimeter of the larger triangle.

17. In , medians , , andare drawn and intersect at G. . What is the length of ?

18. What is the radius of a sphere that has a surface area of ?

19. Write the equation of the locus of points two units from (3, -4).



20.  are intersected by at *G*

and *H* as shown in the diagram. 

and. If x=6, determine if 

and justify your answer.

21. A right circular cone has a base with a diameter of 8cm and an altitude of 9cm. Find the lateral area of the cone to the nearest square centimeter.



22. In the accompanying diagram of circle *O*, chord is parallel to diameter , is drawn, and the measure of arc . What is the measure of ?

23. Two planes *A* and *B* intersect the same sphere at the same perpendicular distance from the center of the sphere. The area of the circle formed by the intersection of plane *A* is . What is the diameter of the circle formed by the intersection of plane *B* and the sphere?

24. Triangle ABC has vertices A(2,4), B(0,1), and C(6,0). Under a translation, A’, the image point of A, is located at (-3,5). Under this same translation, what are the coordinates of C’?

25. What is the equation of the line that passes through the point (5, -3) and is parallel to the line?

26. What is the equation of a line that is a perpendicular bisector of a line segment whose endpoints are (4, -12) and (8, 6)?

27. In a regular pyramid, the base is a square that measures 8 inches on each side. The altitude of the pyramid is 15. What is the volume of the pyramid in cubic inches?

28. Tangents and  are drawn to circle *O*. The ratio of arc BDC to arc BC is 5:4. What is the measure of ?



29. In circle *O*, diameter *AOB* is drawn perpendicular to chord at *E*. and . What is the length of chord ?



30. In, and . If, what is the length of ?

31. In circle O,  and  are secants. BA = 8, EA = 4 and CD = 2. Find the length of DE. *Only an algebraic solution will be accepted.*

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Multiple Choice

1. ABCD is a parallelogram, which statement must be true?

 (1)  (2) 

 (3)  (4) are supplementary

2. Which statement is *not* always true for a parallelogram?

 (1) Consecutive angles are supplementary

 (2) The opposite angles are congruent

 (3) The opposite sides are congruent

 (4) The diagonals are perpendicular

3. Which statement is not a property for all rectangles?

 (1) The angles are congruent

 (2) The diagonals are perpendicular to each other

 (3) The diagonals are congruent

 (4) The diagonals bisect each other

4. Which statement is *not* sufficient to show that *DEFG* is a rectangle?

 (1) 

 (2) 

 (3) 

 (4) 

5. A quadrilateral is a parallelogram if two of its opposite sides are

 (1) parallel and the other two sides are congruent

 (2) parallel only

 (3) congruent and parallel

 (4) congruent only

6. Given any square *ABCD* , which of the following statements is *not* true?

 (1) 

 (2) 

 (3) 

 (4) 

7. Which statement is *not* always true for a rhombus?

 (1) The diagonals are congruent

 (2) The diagonals are perpendicular

 (3) The diagonals bisect each other

 (4) The diagonals bisect opposite angles



8. 9.

10. 11.

12. 13.

14. 15.

16. 17.

18. 19.



20. 21.





 22.

23. 24.