Name \_\_\_\_\_ Mr. Schlansky Date \_\_\_\_\_ Geometry

## CCG Guide to 65 Test

1. Which of the following cannot make up the three sides of a triangle?

1) {3,9,7} 3) {8,12,15}

2) {2,7,5} 4) {9,3,7}

2. Two sides of a triangle are 7 and 11. The third side of the triangle can measure:

- 1)4
- 2) 18
- 3) 8
- 4) 21

3. In the diagram below of  $\triangle TEM$ , medians  $\overline{TB}$ ,  $\overline{EC}$ , and  $\overline{MA}$  intersect at *D*, and TB = 9. Find the length of  $\overline{TD}$ .



4. The triangle graphed below with vertices at B(-3,-2), U(1,1), and L(-2,5), is graphed on the set of axes below. A horizontal stretch of scale factor 3 with respect to x = 0 is represented by  $(x, y) \rightarrow (3x, y)$ . Graph the image of this triangle, after the horizontal stretch on the same set of axes.



5. Describe a sequence of transformations that will map  $\triangle ABC$  onto  $\triangle DEF$  as shown below.



6. On the set of axes below,  $\triangle ABC \cong \triangle DEF$ . Describe a sequence of rigid motions that maps  $\triangle ABC$  onto  $\triangle DEF$ .



7. Under which transformation would  $\triangle A'B'C'$ , the image of  $\triangle ABC$ , *not* be congruent to  $\triangle ABC$ ?

- 1) reflection over the *y*-axis
- 2) rotation of  $90^{\circ}$  clockwise about the origin
- 3) translation of 3 units right and 2 units down
- 4) dilation with a scale factor of 2 centered at the origin

8. The image of triangle ABC after a rotation of 200 degrees clockwise centered at the point (3,-1) is triangle DEF. Are the triangles congruent? Use the properties of rigid motions to explain your answer.

9. Which rotation about its center will carry a regular decagon onto itself?

- 1) 54°
- 2) 162°
- 3) 198°
- 4) 252°

10. A rectangle is graphed on the set of axes below.

A reflection over which line would carry the rectangle onto itself?

1)	y = 2	3)	$y = \frac{1}{2}x - 3$
			· 2

2) y = 10 4)  $y = -\frac{1}{2}x + 7$ 



11. In the diagram below,  $\overline{EM}$  intersects  $\overline{HA}$  at J,  $\overline{EA} \perp \overline{HA}$ , and  $\overline{EM} \perp \overline{HM}$ . If EA = 7.2, EJ = 9, AJ = 5.4, and HM = 3.29, what is the length of  $\overline{MJ}$ , to the *nearest hundredth*?



12. D and E are midpoints of  $\overline{AB}$  and  $\overline{BC}$  respectively. If  $\overline{DE} = 2x + 5$  and  $\overline{AC} = 7x + 1$ , find the measure of  $\overline{AC}$ .



13. In the diagram below, triangle ACD has points B and E on sides  $\overline{AC}$  and  $\overline{AD}$ , respectively, such that  $\overline{BE} \parallel \overline{CD}$ , AB = 1, BC = 3.5, and AD = 18.



What is the length of  $\overline{AE}$ , to the *nearest tenth*?

14. In the diagram of  $\triangle ABC$  shown below,  $\overline{DE} \parallel \overline{BC}$ . If  $\overline{AE} = 6$ ,  $\overline{DE} = 10$ , and  $\overline{AC} = 9$ , find  $\overline{BC}$ 



15. In the diagram below of right triangle *ABC*, altitude  $\overline{BD}$  is drawn to hypotenuse  $\overline{AC}$ , AC = 16, and CD = 7. What is the length of  $\overline{BD}$  to the *nearest tenth*?



16. In the diagram below of  $\triangle ABC$  and  $\triangle XYZ$ , a sequence of rigid motions maps  $\angle A$  onto  $\angle X$ ,  $\angle C$  onto  $\angle Z$ , and  $\overline{AC}$  onto  $\overline{XZ}$ . Which of the following statements is *not* true?



17. In the diagram below,  $\Delta QRX \sim \Delta TUV$ . Which of the following statements is *not* true?



18. In right triangle *JKL* below, altitude  $\overline{KM}$  is drawn to hypotenuse  $\overline{JL}$ . Which of the following proportions is *not* true?



19. In right triangle JKL in the diagram below, KL = 7, JK = 24, JL = 25, and  $\angle K = 90^{\circ}$ .

Which statement is not true?

1)  $\tan L = \frac{24}{7}$ 2)  $\cos L = \frac{24}{25}$ 3)  $\tan J = \frac{7}{24}$ 4)  $\sin J = \frac{7}{25}$ 



Find x to the nearest tenth of a unit





22. Find the measure of  $\angle KXN$  below the *nearest degree*.



23. Right triangle ACT has  $m \angle A = 90^{\circ}$ . Which expression is always equivalent to  $\cos T$ ?1)  $\cos C$ 3)  $\tan T$ 2)  $\sin C$ 4)  $\sin T$ 

24. In a right triangle,  $sin(40 - x)^\circ = cos(3x)^\circ$ . What is the value of x? 1) 10 3) 20 2) 15 4) 25

25. In the diagram below of  $\triangle HAR$  and  $\triangle NTY$ , angles *H* and *N* are right angles, and  $\triangle HAR \sim \triangle NTY$ . If AR = 13 and HR = 12, what is the measure of angle *Y*, to the *nearest degree*?



26. In right triangle *NIX* below,  $m \angle I = 90^\circ$ ,  $m \angle X = 45^\circ$ , and  $\overline{NX} = 6\sqrt{2}$ . Find  $\overline{IX}$ .

- 1)  $6\sqrt{2}$  3)  $12\sqrt{2}$
- 2) 6 4) 12

27. A square pyramid is intersected by a plane passing through the vertex and perpendicular to the base.

Which two-dimensional shape describes this cross section?

- 1) square
- 2) triangle

pentagon
 rectangle



28. In the diagram below, a plane intersects a square pyramid parallel to its base.

Which two-dimensional shape describes this cross section?

- 1) circle 3) triangle
- 2) square

4) pentagon



29. Find the area of *ABCD* 





30. Find the area of GEO to the nearest tenth.



31. Find the volume of a square pyramid with a base with edge length 4 inches and a height of 18 inches.

32. In the diagram below, a cone has a diameter of 16 inches and a slant height of 17 inches. What is the volume of the cone, in terms of  $\pi$ , in cubic inches?



33. Find the volume of the triangular prism below.



34. A cylindrical candleholder has a diameter of 4.5 cm and a height of 20 cm. If the candleholder has a mass of 2900 g, rounded to the nearest whole number, what is its density?



35. A snow cone consists of a paper cone completely filled with shaved ice and topped with a hemisphere of shaved ice, as shown in the diagram below. The inside diameter of both the cone and the hemisphere is 8.3 centimeters. The height of the cone is 10.2 centimeters. The desired density of the shaved ice is  $0.697 \text{ g/cm}^3$ , and the cost, per kilogram, of ice is \$3.83. Determine and state the cost of the ice needed to make 50 snow cones.



36. In the rectangle below,  $\overline{UN} = 8in$  and  $\overline{KN} = 3in$ . Find the volume of the three dimensional object created by rotating rectangle FUNK continuously about side  $\overline{FK}$  in terms of  $\pi$ .



37. The line  $y = -\frac{1}{2}x + 6$  is dilated by a scale factor of 4 and centered at (2,5). Write an equation that represents the image of the line after the dilation.

1) 
$$y = -\frac{1}{2}x + 6$$
  
2)  $y = -\frac{1}{2}x + 24$   
3)  $y = -2x + 6$   
4)  $y = -2x + 24$ 

38. The line  $y = -\frac{1}{2}x + 6$  is dilated by a scale factor of 4 and centered at the origin. Write an equation that represents the image of the line after the dilation.

1) 
$$y = -\frac{1}{2}x + 6$$
  
2)  $y = -\frac{1}{2}x + 24$   
3)  $y = -2x + 6$   
4)  $y = -2x + 24$ 

39. What is an equation of the line that contains the point (3, -1) and is perpendicular to the line whose equation is y = -3x + 2?

1) 
$$y = -3x + 8$$
  
2)  $y = -3x$   
3)  $y = \frac{1}{3}x$   
4)  $y = \frac{1}{3}x - 2$ 

40. An equation of the line that passes through (2, -1) and is parallel to the line 2y + 3x = 8 is

1) 
$$y+1 = -\frac{3}{2}(x-2)$$
  
2)  $y+1 = \frac{2}{3}(x-2)$   
3)  $y-1 = -\frac{3}{2}(x+2)$   
4)  $y-1 = \frac{2}{3}(x+2)$ 

41. Which of the following is the equation of the given circle? 1)  $(x-4)^2 + (y+2)^2 = 9$ 2)  $(x-4)^2 + (y+2)^2 = 3$ 3)  $(x+4)^2 + (y-2)^2 = 9$ 4)  $(x+4)^2 + (y-2)^2 = 3$ 



42. Find the coordinates of the center and radius of a circle whose equation is  $x^2 + y^2 - 16x + 6y + 53 = 0$ ?

43. What are the coordinates of the point on the directed line segment from P(-1,6) to S(5,3) that partitions the segment into a ratio of 1 to 2?



44. In the diagram of circle O,  $\overline{PQ}$  is tangent to O at Q and  $\overline{PRT}$  is a secant. If  $m \angle P = 56$  and  $\widehat{mQT} = 192$ , find  $\widehat{mQR}$ .



45. In the diagram below of circle *O*, chords  $\overline{AE}$  and  $\overline{DC}$  intersect at point *B*, such that  $\widehat{mAC} = 36$  and  $\widehat{mDE} = 20$ . What is  $\underline{m} \angle ABC$ ?



46. In the diagram below, secants  $\overline{RST}$  and  $\overline{RQP}$ , drawn from point *R*, intersect circle *O* at *S*, *T*, *Q*, and *P*.

If RS = 6, ST = 4, and RP = 15, what is the length of  $\overline{RQ}$ ?



47. If  $\overline{BR} = 10$ ,  $\overline{BE} = 4$ ,  $\overline{AE} = 8$ , find  $\overline{ES}$ 



48. In the diagram below, quadrilateral MONK is inscribed in circle J,  $m\angle KMO = 48^{\circ}$  and  $m\angle MON = 80^{\circ}$ . Find the measures of  $m\angle KNO$  and  $m\angle MKN$ .



49. In circle O below, OA = 6, and  $m \angle COA = 100^{\circ}$ . What is the area of the shaded sector?

- 1)  $10\pi$  3)  $10\pi$
- 2)  $26\pi$  4)  $26\pi$



50. A sprinkler system is set up to water the sector shown in the accompanying diagram, with angle *ABC* measuring 57 degrees and radius AB=20 feet. What is the length of arc *AC*, to the nearest tenth of a foot?



51. The area of a sector of a circle with a radius measuring 15 cm is  $75 \pi$  cm<sup>2</sup>. What is the measure of the central angle that forms the sector?

1)	72°	3)	144°
2)	120°	4)	180°

52. A rhombus has diagonals that measure 10 and 24. Find the perimeter of the rhombus.

53. In the diagram of parallelogram *FRED* shown below,  $\overline{ED}$  is extended to *A*, and  $\overline{AF}$  is drawn such that  $\overline{AF} \cong \overline{DF}$ .

If  $m \angle R = 124^\circ$ , what is  $m \angle AFD$ ?

- 1) 124°
- 2) 112°
- 3) 68°
- 4) 56°



54. A triangle has vertices A(-2,4), B(6,2), and C(1,-1). Prove that  $\triangle ABC$  is an isosceles right triangle. [The use of the set of axes below is optional.]



55. The vertices of quadrilateral *MATH* have coordinates M(-4, 2), A(-1, -3), T(9, 3), and H(6, 8). Prove that quadrilateral *MATH* is a rectangle but not a square. [The use of the set of axes below is optional.]



56. Quadrilateral ABCD has vertices A(3,1) B(-3,5) C(5,4) and D(2,6). Prove quadrilateral ABCD is a trapezoid but *not* an isosceles trapezoid.



57. Triangle *PET* has vertices with coordinates P(-6,4), E(6,8), and T(-4,-2). Prove  $\triangle PET$  is a right triangle. State the coordinates of *N*, the image of *P*, after a 180° rotation centered at (1,3). Prove *PENT* is a rectangle. [The use of the set of axes below is optional.]



## Reference Sheet for Geometry (NGLS)

v

	Cylinder	V = Bh where <i>B</i> is the area of the base
	General Prism	V = Bh where <i>B</i> is the area of the base
Volume	Sphere	$V = \frac{4}{3}\pi r^3$
	Cone	$V = \frac{1}{3}Bh$ where <i>B</i> is the area of the base
	Pyramid	$V = \frac{1}{3}Bh$ where <i>B</i> is the area of the base