GEOMETRY
Practice Tests
Next Generation Learning Standards

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Reference Sheet for Geometry (NGLS)

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

Test 1
Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the space provided the numeral preceding the word or expression that best completes the statement or answers the question. [48]

1. Which of the following real life objects would most likely be modeled by a pyramid?
(1) picture frame   (2) tent   (3) pool   (4) house   1 _____

2. Each of the following shapes is inscribed in a circle with a radius of 5 cm. Which of the shapes has a perimeter closest in value to the circumference of the circle?
(1) a square   (3) a regular octagon
(2) a regular hexagon   (4) a regular dodecagon   2 _____

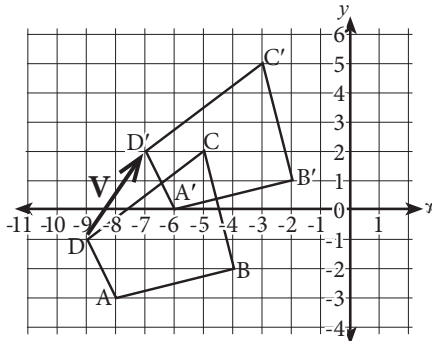3. If $\triangle JKL \cong \triangle MNO$, which statement is always true?
(1) $\angle KLJ \cong \angle MNO$ (3) $\overline{JL} \cong \overline{MO}$
(2) $\angle KJL \cong \angle MON$ (4) $\overline{JK} \cong \overline{ON}$ 3 _____

4. Segment ST has endpoints of $S(-2, 4)$ and $T(-6, 0)$. What is the midpoint of segment ST?
(1) (2, 2)   (2) (–4, –2)   (3) (–4, 2)   (4) (–8, 4)   4 _____

5. Vector V describes the translation that maps quadrilateral $ABCD$ to quadrilateral $A'B'C'D'$ shown to the right. What is the magnitude of V?
(1) 5   (3) 13
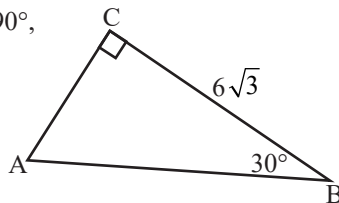(2) $\sqrt{5}$ (4) $\sqrt{13}$

5 _____

6. Which type of proof uses boxes and arrows to show the logical connections between statements?
(1) two-column table   (3) flowproof
(2) paragraph proof   (4) indirect proof   6 _____

7. In right triangle ABC, m$\angle C = 90°$, m$\angle B = 30°$, and $CB = 6\sqrt{3}$.
The length of $\overline{AB}$ is
(1) $3\sqrt{3}$ (3) 12
(2) 9   (4) $12\sqrt{3}$ 7 _____

GEOMETRY
Test 1

8. What is the point of concurrency of the medians in a triangle?
(1) altitude   (2) incenter   (3) circumcenter   (4) centroid   8 _____

9. If ℓ_1 and ℓ_2 are two distinct lines that are parallel to another line ℓ_3, then ℓ_1 and ℓ_2 are
(1) perpendicular to each other. (3) both equidistant.
(2) parallel to each other.   (4) both equidistant from the third line. 9 _____

10. Many of the ancient pyramids of Egypt are still buried in the sand. Satellites can now locate some of these buried structures using infrared technology. One of the buried pyramids has a height of 250 feet and square base with a side length of 340 feet. How much sand, to the *nearest thousand cubic feet*, is displaced by the pyramid?
(1) 85,000   (2) 7,083,000   (3) 9,633,000   (4) 28,900,000   10 _____

11. In a right triangle ABC, where m$\angle C = 90°$, which of the following statements is always true?
(1) $\sin A = \tan B$ (3) $\cos A = \tan B$
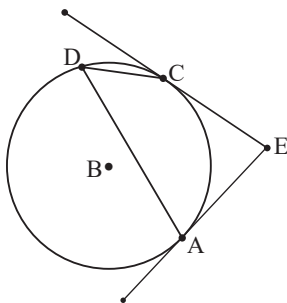(2) $\sin A = \cos B$ (4) $\tan A = \tan B$ 11 _____

12. In the diagram to the right, $\overline{EC}$ is tangent to circle B at C. $\overline{EA}$ is tangent to circle B at A. If m$\angle CDA = 50°$, find m $\overparen{CA}$?
(1) 50°
(2) 80°
(3) 90°
(4) 100°

12 _____

13. Which transformation preserves both distance and angle?
(1) translation   (3) vertical stretch
(2) horizontal stretch   (4) dilation   13 _____

14. Which equation represents a line that is parallel to the line $2y - 10 = x$?
(1) $2y = 4x - 6$ (2) $2y = x + 6$ (3) $2y = -x - 10$ (4) $2y = -4x - 8$ 14 _____

15. The diagonals of a square intersect at the origin. Which transformation would *not* map the square onto itself?
(1) $r_{y\text{-}axis}$ (2) $R_{-270°}$ (3) $T_{3,-3}$ (4) $r_{y=-x}$ 15 _____

16. Katrina is making a scaled drawing for an L shaped garden on graph paper using the scale below. The vertices of the L shape are as follows: (0, 0), (10, 0), (10, 2), (2, 2), (2, 6), and (0, 6). Using the scale below, what is the perimeter of the garden, in feet?

| 1 space = 2 feet |

(1) 28   (2) 32   (3) 56   (4) 64   16 _____

Test 1

17. The figure above shows the construction of an angle bisector. *B* and *C* are each connected to *D*. The construction marks can be used to prove $\triangle ABD$ is congruent to $\triangle ACD$. Given a rigid motion that would reflect $\triangle ABD$ in $\overline{AD}$, such that point *B* maps to point *C* and the radii in the arcs are congruent, these triangles could be proven congruent by
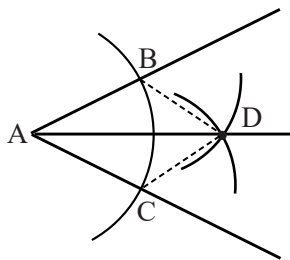
(1) SAS only   (3) SSS only
(2) SSS or SAS   (4) ASA or HL   17 _____

18. Winter Creations is designing a box to hold twenty-four of their top selling spherical holiday ornaments. Each ornament has a radius of 1.75 inches. They want to configure the ornaments in two layers of four ornaments by three ornaments. To prevent breakage, the company wants $\frac{1}{2}$ inch of packaging between any two adjacent ornaments as well as between the ornaments and the sides of the box. Find the smallest possible dimensions of the box that meets these criteria.

(1) 12″ × 9″ × 6″   (3) 14″ × 10.5″ × 7″
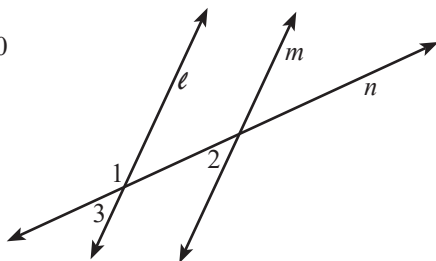(2) 13.5″ × 10″ × 6.5″   (4) 16.5″ × 12.5″ × 8.5″   18 _____

19. Allison is planting a triangular rose garden. The lengths of two sides of the plot are 8 feet and 12 feet, and the angle between them is 87°. Which expression could be used to find the area of this garden?

(1) $8 \cdot 12 \cdot \sin 87°$ (3) $\frac{1}{2} \cdot 8 \cdot 12 \cdot \cos 87°$

(2) $8 \cdot 12 \cdot \cos 87°$ (4) $\frac{1}{2} \cdot 8 \cdot 12 \cdot \sin 87°$ 19 _____

20. Line *l* is parallel to line *m*. If m∠1 = 2x + 120 and m∠2 = $x^2 - 6x$, what is m∠3?

(1) 10°
(2) 30°
(3) 40°
(4) 140°   20 _____

21. $\triangle MNO \cong \triangle PQR$ Which of the following statements is *not* necessarily true?

(1) $\overline{NO} \cong \overline{QR}$ (3) $\angle OMN \cong \angle RQP$

(2) $\overline{QP} \cong \overline{NM}$ (4) $\angle NOM \cong \angle QRP$ 21 _____

22. Which choice correctly identifies the center and the radius of the circle expressed by the equation $x^2 + y^2 + 10x - 2y - 10 = 0$?
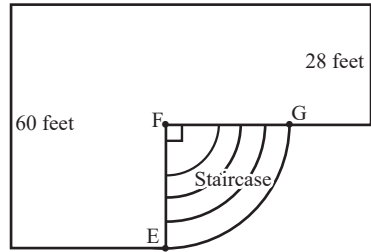
(1) C: (5, –1) r = 6   (3) C: (–5, 1) r = 6
(2) C: (5, –1) r = $\sqrt{10}$ (4) C: (–5, 1) r = $\sqrt{10}$ 22 _____

Test 1

23. The owners of a new, L-shaped office complex are building a shallow staircase up to the main doors of the building as shown in the accompanying diagram. The staircase is a sector of a circle with radius $\overline{EF}$. Find the length around the lowest step, represented by $\overparen{EG}$, to the *nearest foot*.

(1) 44   (2) 50   (3) 94   (4) 201   23 ____

24. Which description is *always* the composition of two different types of transformations?

(1) line reflection   (2) rotation   (3) translation   (4) glide reflection   24 ____

Part II

   Answer all 7 questions in this part. Each correct answer will receive **2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil.** [16]

25. At a concert, the number of security guards needed is based on the average density of people in an area of $25' \times 25'$ called a block. The concert space measures $350'$ by $200'$. The number of security guards is based on the number of blocks necessary and each security guard can only be responsible for one block. 12,000 people are expected to attend the concert.

   a) How many security guards will be needed? _____

   b) How many people, rounded to the
       nearest 10, will be in each block? _____
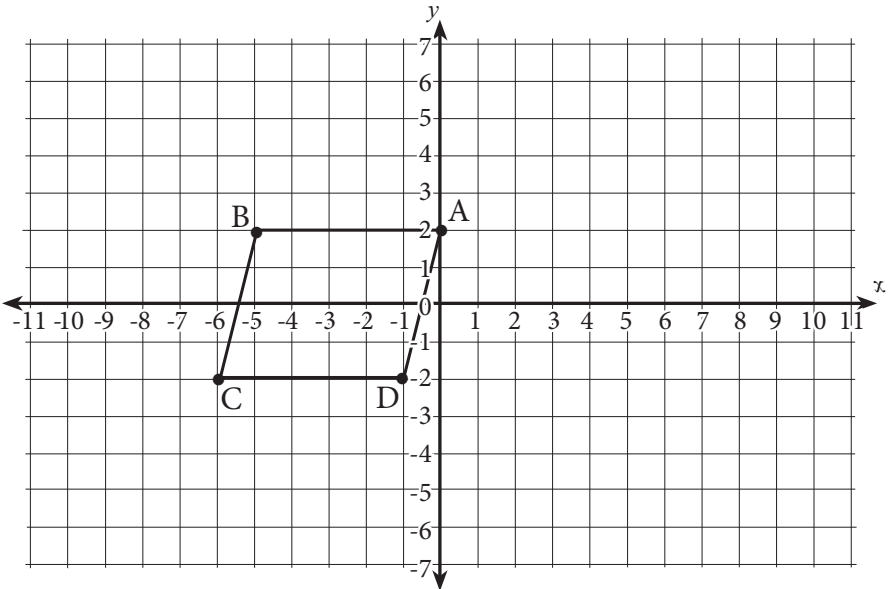
Test 1

26. Determine whether the accompanying triangles
   are congruent. Justify your response.
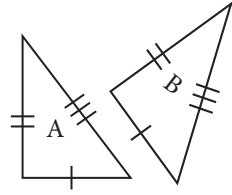
27. The coordinate plane below contains the sketch of the plans for a new four
sided playground represented by quadrilateral *ABCD*.

   a) Sketch the play area if it must be moved using the rule of $T_{(-5, 2)}$.

   *b*) Label the coordinates of the image and state its coordinates below.

28. A container in the shape of a sphere with a diameter of 20 cm is designed to
hold gourmet ice cream. What is the volume of ice cream that can held by the
container? Round your answer to the *appropriate whole number*.

Test 1
29. Two sides of a triangular-shaped pool measure 16 feet and 21 feet, and the included angle measures 58°. What is the area, to the *nearest tenth of a square foot*, of a nylon cover that would exactly cover the surface of the pool?

30. Use a compass and straightedge to construct a perpendicular bisector. [Leave all construction marks.]

A ●————————————● B
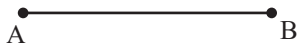
31. Given regular polygon *EFGH*, find m∠*FGH*.

E ————————— F
2x + 5

5x
H   G
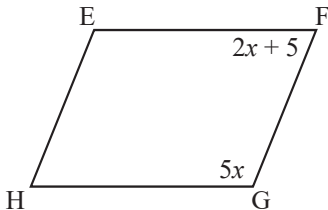
Test 1
Part III

Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

32. In the diagram below, $m\angle A \cong m\angle D$, $\overline{DE} \cong \overline{AB}$, $\overline{DF} \cong \overline{AC}$, and $\overline{AB} \parallel \overline{DE}$.
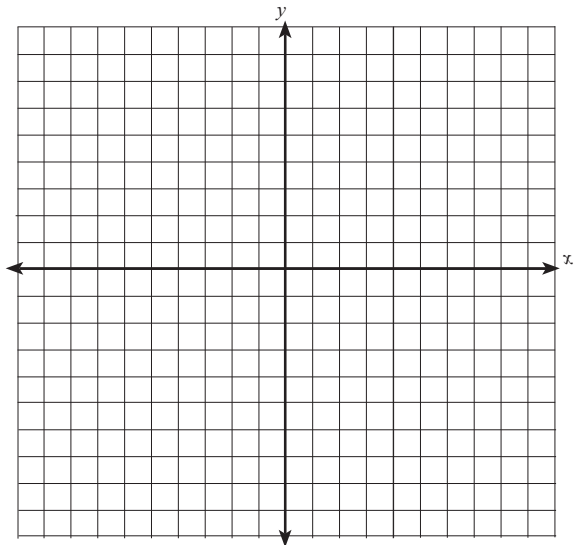
   a) Construct and apply one or more rigid motions that maps Figure 1 to Figure 2.

Figure 1   Figure 2
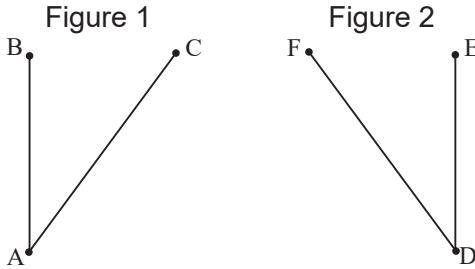
   b) If $\overline{BC}$ and $\overline{FE}$ are drawn, would $\triangle ABC$ and $\triangle DEF$ be congruent? Justify your answer.

33. Brian uses the equation $x^2 + y^2 = 9$ to represent the shape of a garden on graph paper.

Graph $x^2 + y^2 = 9$ on the grid.

What is the area of the garden to *the nearest square unit*?

Test 1

34. Let A, B, and C be the intersections of three major hiking trails at Camp Verde. Joe wants to place a restroom that is equidistant from the intersection of the three trails shown to the right. Determine the location of the restroom using constructions. [Leave all construction marks.]
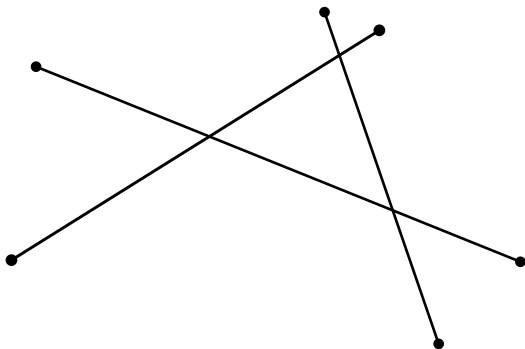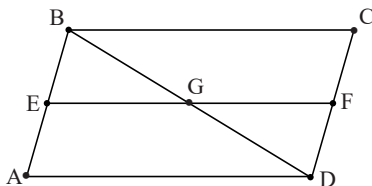

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer with no work shown will receive only 1 credit. The answer should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

35. Given: irregular polygon $ABCD$, $\overline{EF}$
    bisects $\overline{AB}$ at E, $\overline{EF}$ bisects $\overline{CD}$ at F.

    Prove That: $\overline{EG} \cong \overline{FG}$

Test 2
Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the space provided the numeral preceding the word or expression that best completes the statement or answers the question. [48]

1. Which transformation does *not* always preserve distance and angle?
(1) dilation   (2) reflection   (3) rotation   (4) translation   1 _____

2. Which two shapes could be used to model the round pencil in the picture to the right?
(1) rectangular prism and a pyramid
(2) cylinder and a pyramid
(3) rectangular prism and a cone
(4) cylinder and a cone   2 _____

3. Which figure would be rotated 360 degrees to create a cone with an altitude perpendicular to its base?
(1) an obtuse triangle   (3) a right triangle rotated about its leg
(2) a rectangle   (4) a hexagon   3 _____

4. The line segment that connects two nonconsecutive vertices in a polygon is called a
(1) side   (2) diagonal   (3) face   (4) point   4 _____

5. Michelle and Richard Jones just bought their first home. They decide to place two identical circular throw rugs on the hardwood floor in their rectangular living room. They are still deciding where to place the rugs, but one of the options they are considering is shown in the diagram. Using the relevant dimensions (l = length, w = width) of the room and the rugs (r = radius), which of the following formulas is the best choice to calculate the area of the hardwood floor that is still visible?

Living Room

Throw Rug

Throw Rug
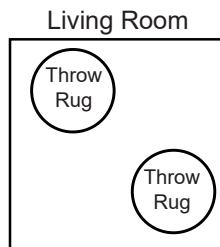
(1) $lw - \pi r^2$ (2) $lw + 2\pi r^2$ (3) $lw + \pi r^2$ (4) $lw - 2\pi r^2$ 5 _____

6. $\overline{AB}$ has a length of $2\sqrt{10}$. What is the length of $\overline{A'B'}$, the image of $\overline{AB}$ after a dilation with a scale factor of 3?
(1) $5\sqrt{10}$ (2) $2\sqrt{30}$ (3) $6\sqrt{10}$ (4) $6\sqrt{30}$ 6 _____

7. If $\sin(3x + 2)° = \cos(4x - 10)°$, what is the value of x to the *nearest tenth*?
(1) 7.6   (2) 12.0   (3) 14.0   (4) 26.9   7 _____

8. Which of the following transformations preserves angle measure but *not* distance?
(1) dilation   (2) translation   (3) vertical stretch   (4) rotation   8 _____