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	$V = \dfrac{4}{3}\pi r^3$
	Cone	$V = \dfrac{1}{3}Bh$ where B is the area of the base
	Pyramid	$V = \dfrac{1}{3}Bh$ 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?
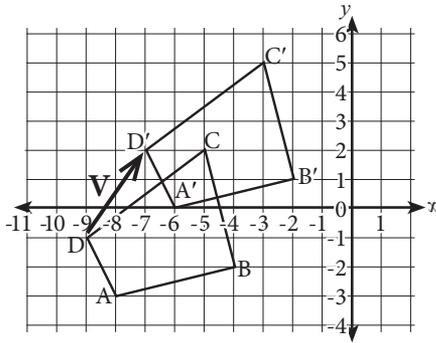(1) $\angle KLJ \cong \angle MNO$ (3) $\overline{JL} \cong \overline{MO}$
(2) $\angle KJL \cong \angle MON$ (4) $\overline{JK} \cong \overline{ON}$ 3 _____

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?
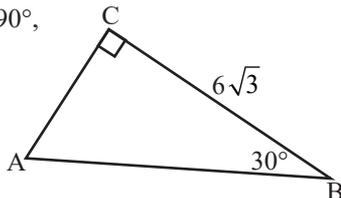(1) two-column table   (3) flowproof
(2) paragraph proof   (4) indirect proof   6 _____

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 _____

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) $\cos A = \tan B$
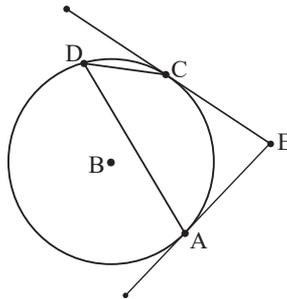(2) $\sin A = \cos B$ (4) $\tan A = \tan B$ 11 _____

12. In the diagram to the right, $\overleftrightarrow{EC}$ is tangent to circle B at C. $\overleftrightarrow{EA}$ 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 _____

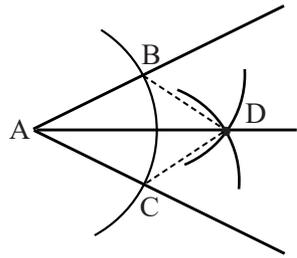15. The diagonals of a square intersect at the origin. Which transformation would *not* map the square onto itself?
(1) $r_{y\text{-axis}}$ (2) $R_{-270°}$ (3) $T_{3,-3}$ (4) $r_{y=-x}$ 15 _____

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 _____

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) $12'' \times 9'' \times 6''$ (3) $14'' \times 10.5'' \times 7''$
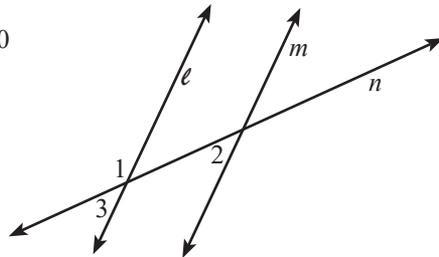(2) $13.5'' \times 10'' \times 6.5''$ (4) $16.5'' \times 12.5'' \times 8.5''$ 18 ____

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$\angle 1 = 2x + 120$
and m$\angle 2 = x^2 - 6x$,
what is m$\angle 3$?
(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
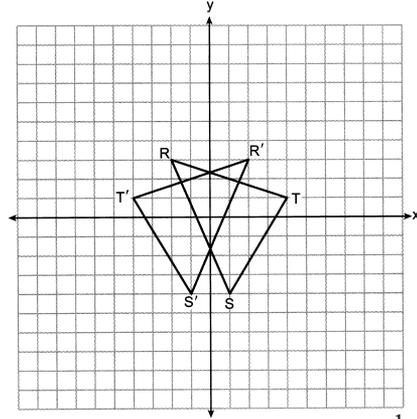(2) C: (5, –1) r = $\sqrt{10}$ (4) C: (–5, 1) r = $\sqrt{10}$ 22 ____

January 2026
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. On the set of axes, $\triangle RST$ and its image, $\triangle R'S'T'$, are graphed.

Which rigid motion is sufficient to prove $\triangle RST \cong \triangle R'S'T'$?
(1) a rotation of 90° clockwise about the origin
(2) a translation 4 units to the right
(3) a reflection over the x-axis
(4) a reflection over the y-axis

1 _____

2. Which regular polygon would carry onto itself after a rotation of 60° about its center?
(1) pentagon   (2) hexagon   (3) octagon   (4) decagon   2 _____

3. The right triangle is continuously rotated about the 4 cm side. The solid formed is
(1) a cone with a height of 4 cm and a radius of 7 cm
(2) a cone with a height of 4 cm and a radius of 14 cm
(3) a pyramid with a height of 4 cm and a base length of 7 cm
(4) a pyramid with a height of 4 cm and a base length of 14 cm
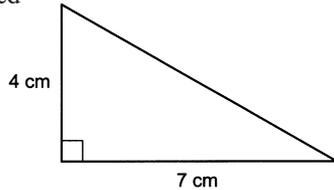
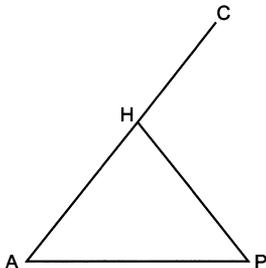3 _____

4. In isosceles triangle AHP, $\overline{AH} \cong \overline{PH}$, and $\overline{AH}$ is extended through H to C.

If m$\angle A = (2x + 12)°$ and m$\angle P = (3x - 8)°$, what is the measure of $\angle CHP$?
(1) 52°   (3) 104°
(2) 76°   (4) 128°

4 _____

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. A triangle has vertices with coordinates (2, 1), (0, 3), and (–2, –1).
Determine and state the coordinates of the vertices of the image of the triangle after a reflection over the x-axis followed by a translation of 3 units to the right and 2 units down.   [The use of the set of axes below is optional.]
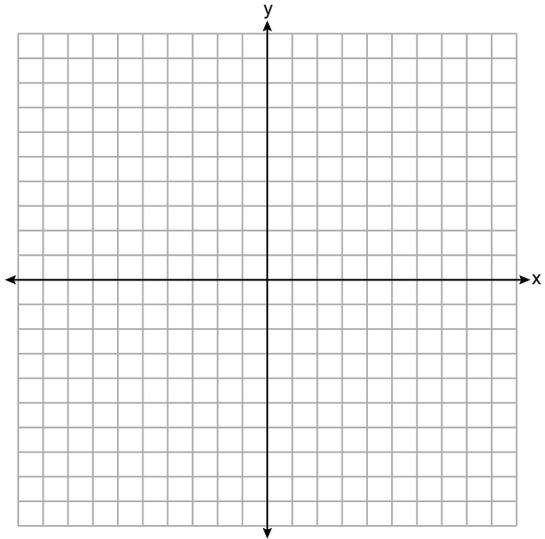
26. A cylindrical bucket is being used to transport topsoil. The bucket has an inside diameter of 10 inches and a height of 15 inches.

If the topsoil weighs 0.0231 pound per cubic inch, determine and state the weight of the topsoil in the bucket when the bucket is full, to the *nearest pound*.

27. In right triangle SRT, $m\angle R = 90°$, $m\angle S = 27°$, and $ST = 31.8$. Determine and state the length of $\overline{SR}$, to the *nearest tenth*.

28. In $\triangle LET$, $LE = 7.5$, $ET = 9.3$, and m$\angle LET = 115°$.
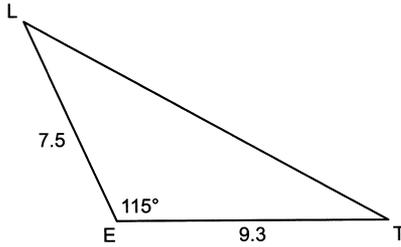
Determine and state the area of $\triangle LET$, to the *nearest tenth*.

29. A pool owner has a circular deck that surrounds her circular pool, as modeled in the diagram.
The pool has a diameter of 24 feet. The distance from the edge of the pool to the outer edge of the deck is 8 feet.
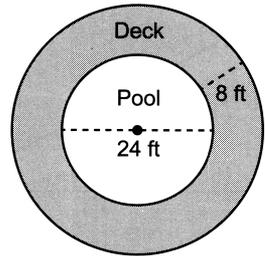

Determine and state the number of square feet of the deck, to the *nearest square foot*.

30. Use a compass and straightedge to construct an equilateral triangle with $\overline{AB}$, shown below, as one of the sides.   [Leave all construction marks.]

A ————————————————— B

31. In the diagram, right triangle ABC is inscribed in the circle with right angle ABC.

Explain why $\overline{AC}$ must be a diameter of the circle.

Part III
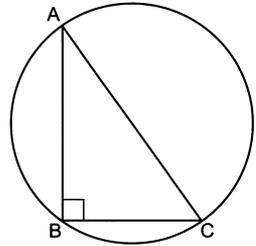
Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]
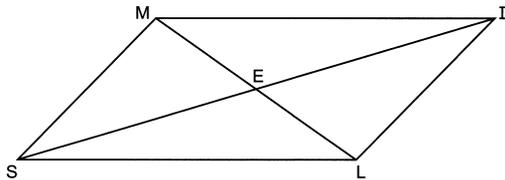
32. In isosceles triangle ABC, $\overline{AD}$ is an altitude drawn to base $\overline{BC}$.

If m$\angle BAC = 80°$ and $AD = 8$, determine and state the perimeter of $\triangle ABC$, to the *nearest tenth*.
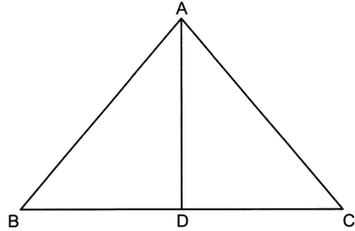
33. In quadrilateral $SMIL$, diagonals $\overline{IS}$ and $\overline{ML}$ intersect at point E, $\overline{MS} \parallel \overline{IL}$, and $\overline{MS} \cong \overline{IL}$.

Prove: $\triangle MIE \cong \triangle LSE$

34. A solid glass trophy is composed of a rectangular prism and a rectangular pyramid, as modeled. The rectangular prism has a length of 12 centimeters, a width of 6 centimeters, and a height of 3 centimeters.

The height of the pyramid is 10 centimeters. If the density of glass is 2.5 grams per cubic centimeter, determine and state the mass of the trophy, in grams.

3 cm

6 cm

12 cm
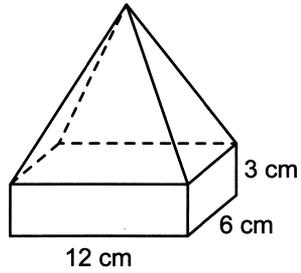
Part IV

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. Quadrilateral *ABCD* is graphed on the set of axes below, with vertices at coordinates *A*(–3, 1), *B*(–3, –7), *C*(6, 5), and *D*(0, 5). Segment *EF* is graphed with endpoints at coordinates *E*(–3, –3) and *F*(3, 5).
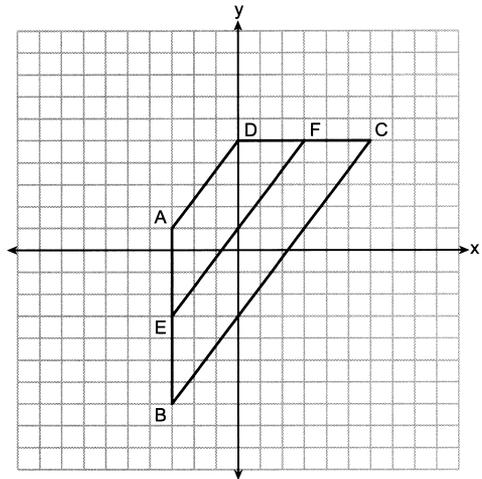
Prove *ABCD* is a trapezoid.

Use coordinate geometry to prove $\overline{EF}$ is parallel to $\overline{AD}$ and $\overline{BC}$.

Is $EF = \frac{1}{2}(AD + BC)$? Use coordinate geometry to justify your answer.