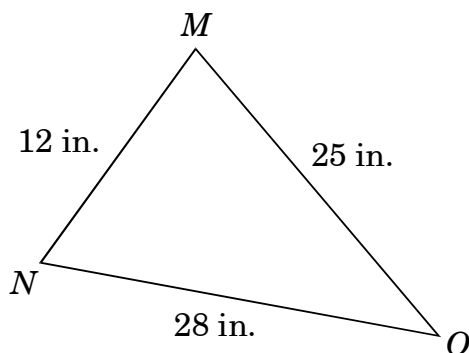1. The conditional statement "all 45° angles are acute angles" is true. Based on this conditional statement, which of the following can be concluded from the additional statement "the measure of ∠A is 45"?

   A   The complement of ∠A is not an acute angle.

   B   The supplement of ∠A is an acute angle.

   C   ∠A is an acute angle.

   D   ∠A is not an acute angle.

2. △MNO is shown below.

   Which statement about this triangle is true?

   A $m\angle O > m\angle M$

   B $m\angle M > m\angle N$

   C $m\angle M < m\angle N$

   D $m\angle N < m\angle O$

3. What is the contrapositive of the statement below?

   > If a triangle is isosceles, then it has two congruent sides.

   A   If a triangle does not have two congruent sides, then it is not isosceles.

   B   If a triangle is isosceles, then it does not have two congruent sides.

   C   If a triangle has two congruent sides, then it is isosceles.

   D   If a triangle is not isosceles, then it does not have two congruent sides.

4. Which statement is the inverse of the statement in the box?

   > If a quadrilateral is a rectangle, then it is a parallelogram.

   A   If a quadrilateral is not a parallelogram, then it is not a rectangle.

   B   If a quadrilateral is a parallelogram, then it is a rectangle.

   C   If a quadrilateral is not a rectangle, then it is not a parallelogram.

   D   A quadrilateral is a rectangle if and only if it is a parallelogram.

5.   Given:

> If there was lightning, then we did not swim.
> If there was lightning, then we did not jog.

Using either one or both of the given statements, which conclusion is valid?

A   If we did not swim, then we did not jog.

B   If we did not jog, then there was lightning.

C   If we did swim, then we did not jog.
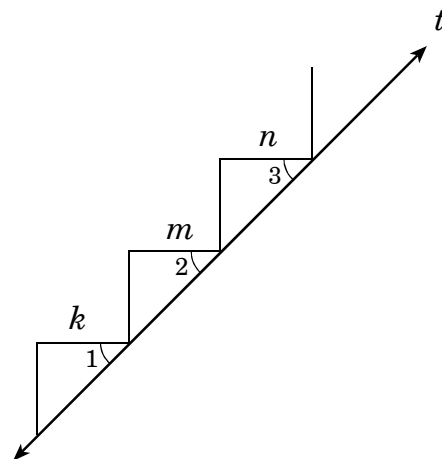
D   If we did jog, then there was not lightning.

6.   Given the statements:

> Linear pairs are supplementary.
> ∠1 and ∠2 are supplementary.

Using either one or both of the given statements, which conclusion is valid?

A   ∠1 and ∠2 form a linear pair.

B   Angles that are not supplementary are not linear pairs.

C   ∠1 ≅ ∠2

D   Supplementary angles are linear pairs.

7.   Given: $k \parallel m \parallel n$

Which statement justifies the conclusion that ∠1 ≅ ∠2 ≅ ∠3?

A   If $k \parallel m \parallel n$ and are cut by transversal t, then alternate interior angles are congruent.

B   If $k \parallel m \parallel n$ and are cut by transversal t, then vertical angles are congruent.

C   If $k \parallel m \parallel n$ and are cut by transversal $t,$ then alternate exterior angles are congruent.

D   If $k \parallel m \parallel n$ and are cut by transversal t, then corresponding angles are congruent.

8.   In the diagram, $\overline{GH} \parallel \overline{IJ}$.
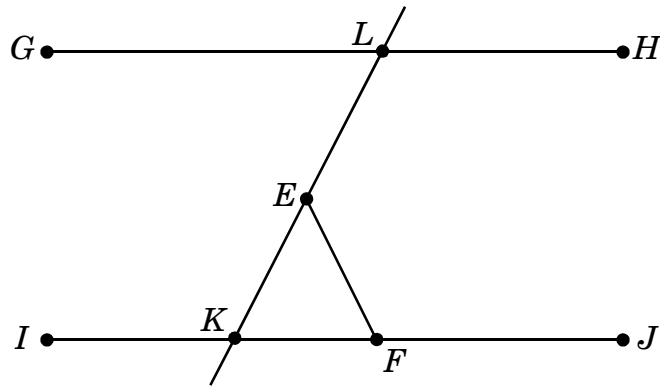
If $m\angle GLK = 55$ and $m\angle EFJ = 120$, what is $m\angle KEF$?

A   55

B   60

C   65

D   70

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9.   Given $\overleftrightarrow{RS} \parallel \overleftrightarrow{TU}$, $m\angle 7 = (3x - 10)$, and $m\angle 3 = (2x + 5)$.
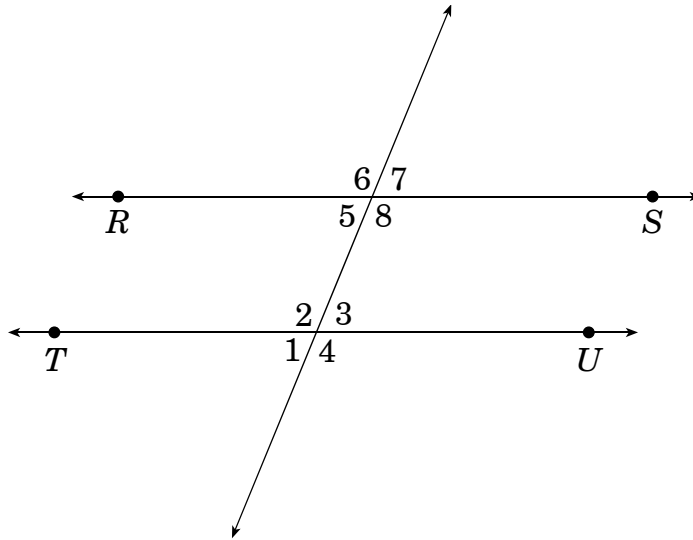
What is $m\angle 1$?

A   145

B   75

C   35

D   15

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10. $\angle XYZ$ shown below has a measure
      of $(8x+12)^\circ$. The measure of $\angle 1$ is
      $(4x+8)^\circ$, and the measure of $\angle 2$ is
      $(9x-11)^\circ$.
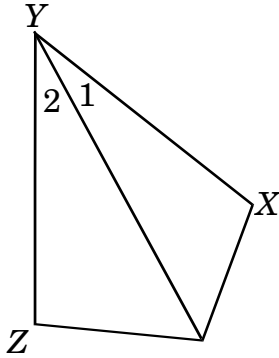
      What is the measure of $\angle XYZ$?

      A   3°

      B   20°

      C   36°

      D   60°

11.   In the drawing, what is the measure
      of angle y?

      A   40°

      B   60°

      C   80°

      D   100°

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                           educational purposes only; not for personal or financial gain.
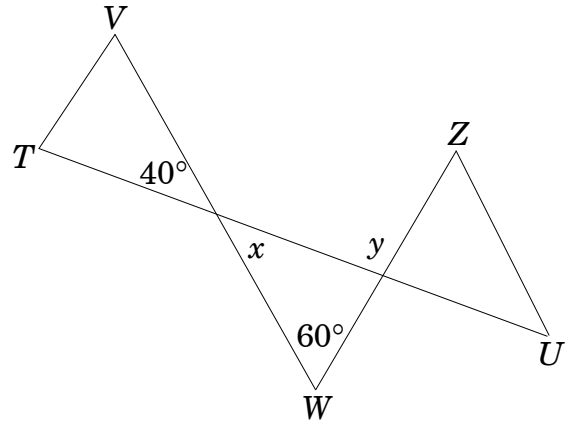
12.   Given $m\angle RQS = \frac{1}{2}x + 4$, $m\angle SQT = \frac{3}{4}x - 6$, and $m\angle RQT = 2x - 47$.
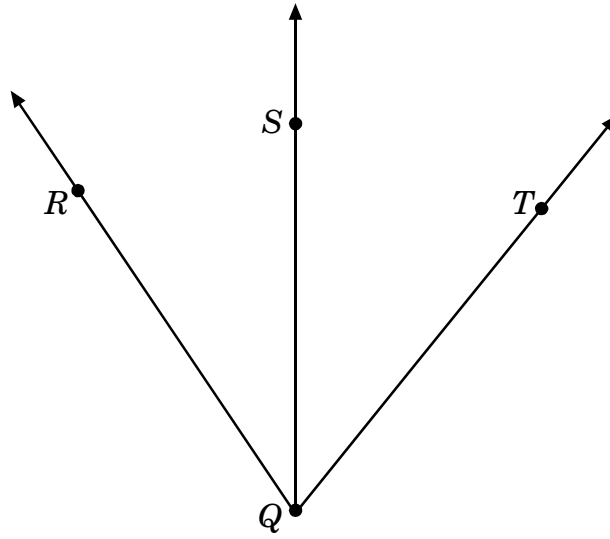
What is $m\angle RQS$?

A   24

B   34

C   39

D   60

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13.   Given: $ABCD$ is an isosceles trapezoid. M is the midpoint of $\overline{AB}$.
      Prove: $\overline{DM} \cong \overline{CM}$
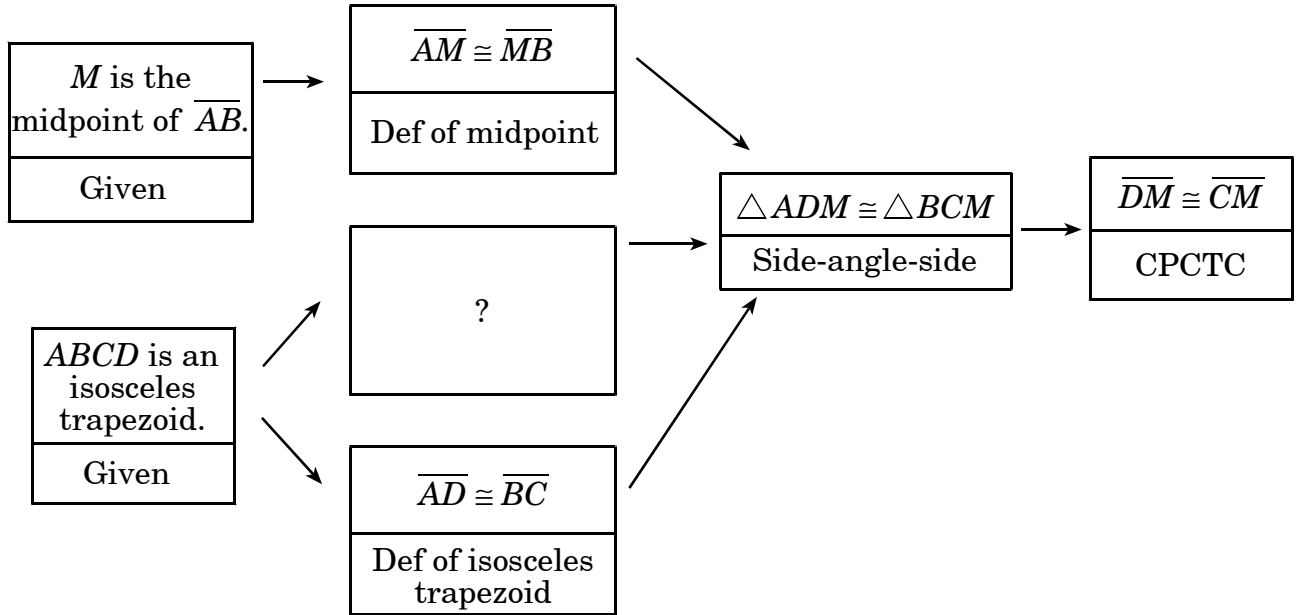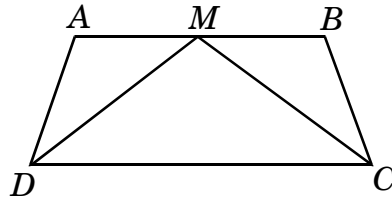
What is the missing statement and reason that completes the proof shown above?

A $\overline{AD} \cong \overline{BC}$; the legs of an isosceles trapezoid are congruent.

B $\angle MAD \cong \angle MBC$; the base angles of an isosceles trapezoid are congruent.

C $\overline{AM} \cong \overline{BM}$; the corresponding parts of congruent triangles are congruent.

D $\angle ABC \cong \angle DAB$; if lines are parallel, interior angles on the same side of a
      transversal are supplementary.

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14. A regular octagon is inscribed in a circle. What is the degree measure of each arc joining the consecutive vertices?

    A   40°

    B   45°

    C   54°

    D   60°

15. If *KLMN* is a rhombus, and $m\angle KLM = 80$, what is the measure of $\angle 1$?
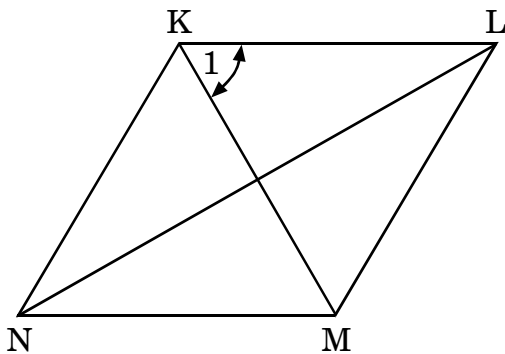
    A   40°

    B   50°

    C   80°

    D   90°

16. The measure of each exterior angle of a regular polygon is 45°. How many sides does the polygon have?

    A   4

    B   5

    C   8

    D   9

17. In a hexagon, three angles have the same measure. The measure of each of the congruent angles is twice the measure of the fourth angle and is half the measure of the fifth angle. The sixth angle measures 115°. What is the measure of the smallest angle?

    A   41°

    B   55°

    C   110°

    D   121°

18.   In the circle below, what is the value of x?
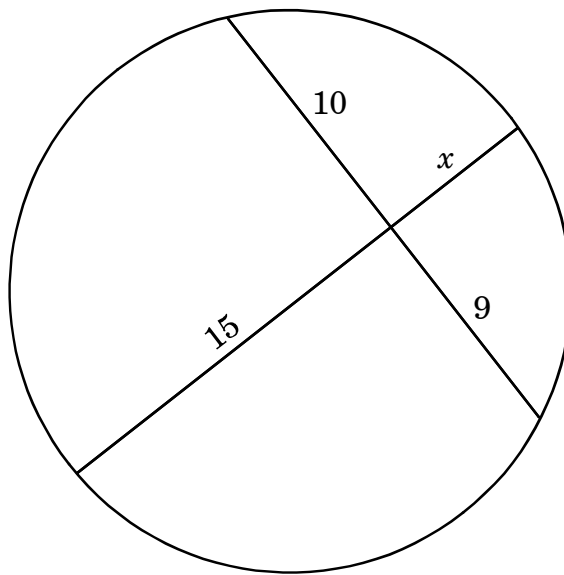
A   4 units

B   6 units

C   7 units

D   9 units

19.   In *JKLM*, $\overline{JK} \perp \overline{KL}$ and $\overline{JK} \parallel \overline{ML}$.
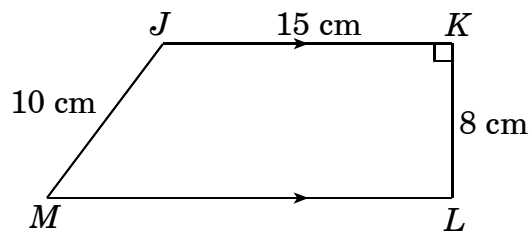
What is the area of the trapezoid?

A   120 sq cm

B   144 sq cm

C   164 sq cm

D   168 sq cm

20.   A triangle has side lengths of 10 cm, 15 cm, and 20 cm. Which side lengths form the largest angle?

A   5 cm, 10 cm

B   10 cm, 15 cm

C   10 cm, 20 cm

D   15 cm, 20 cm

21.   A gardener wants to enclose a circular garden with a square fence, as shown below.
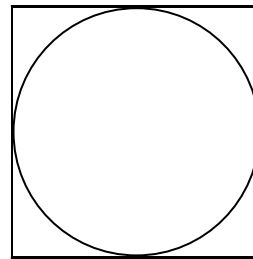
If the circumference of the circular garden is about 48 feet, which of the following is the **approximate** length of fencing needed?

A   31 ft

B   61 ft

C   122 ft

D   244 ft

22.   The vertices of a hexagon are $(6, 7)$, $(9, 1)$, $(6, {}^{-}4)$, $({}^{-}1, {}^{-}4)$, $({}^{-}6, 1)$, and $({}^{-}1, 7)$. Which **best** describes the hexagon?

A   nonregular and convex

B   nonregular and concave

C   regular and convex

D   regular and concave

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23.   Jill wants to measure the width of a river. She marks distances as shown in the diagram.
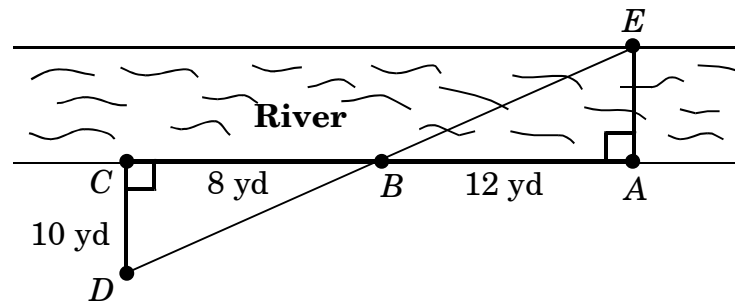
Using this information, what is the ***approximate*** width of the river?

A   6.6 yards

B   10 yards

C   12.8 yards

D   15 yards

24.   The exterior angle of a base angle in an isosceles triangle is 100°. What is the measure of
       the vertex angle?

A   20°

B   40°

C   60°

D   80°

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25.   Right $\triangle SRU$ is shown below.
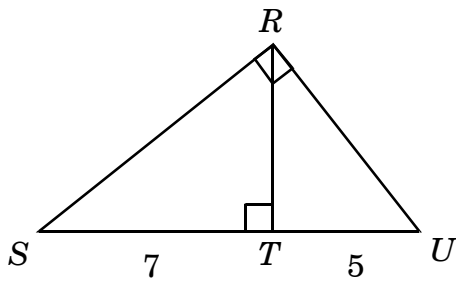
What is the length of $\overline{RS}$?

A $\sqrt{84}$

B $\sqrt{74}$

C $\sqrt{60}$

D $\sqrt{35}$

26.   If $PQRS$ is a rhombus, which statement must be true?
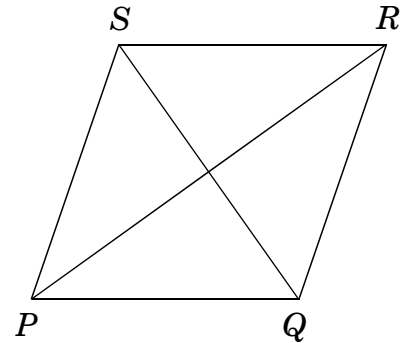
A $\angle PSR$ is a right angle.

B $\overline{PR} \cong \overline{QS}$

C $\angle PQR \cong \angle QRS$

D $\overline{PQ} \cong \overline{QR}$

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27.   In the picture below, what are the coordinates of P?

A $(0, 6, 6)$

B $(^-6, 0, 6)$

C $(^-6, 6, 0)$

D $(6, ^-6, 6)$

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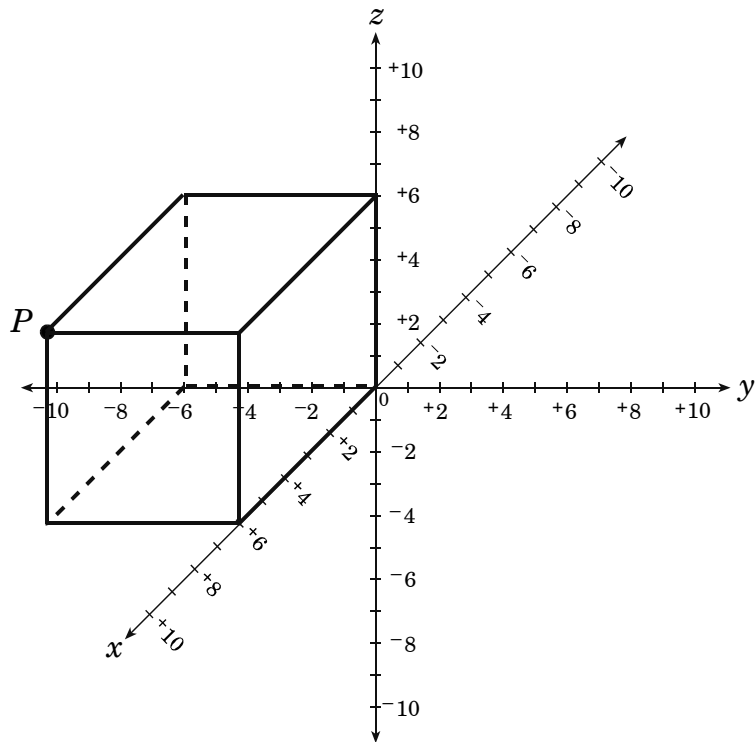
28.   A spherical foam ball, 10 inches in diameter, is used to make a tabletop decoration for a
       party. To make the decoration sit flat on the table, a horizontal slice is removed from the
       bottom of the ball, as shown below.
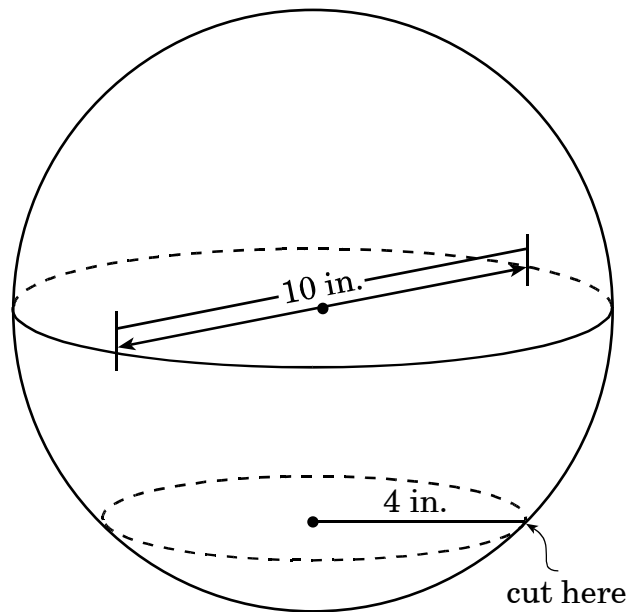
       If the radius of the flat surface formed by the cut is 4 inches, what is the height of the
       decoration?

    A   10 in.

    B   8 in.

    C   6 in.

    D   4 in.

_____

29.   What is the ***approximate*** surface area of a regular tetrahedron with edge length 12 cm?

    A   166.3 sq cm

    B   187.1 sq cm

    C   249.4 sq cm

    D   498.8 sq cm

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30.   Two tetrahedra are congruent. One tetrahedron is glued to the other so that the glued faces of the two tetrahedra completely cover each other, producing a new polyhedron. How many faces does the new polyhedron have?

A   6

B   7

C   8

D   9

31.   The intersection of a sphere and a plane is a circle with a radius of 8 cm. If the sphere has a radius of 18 cm, how far is the plane from the center of the sphere?

A   16.12 cm

B   14.97 cm

C   10.00 cm

D   8.00 cm

32.   A regular octahedron has eight faces that are congruent equilateral triangles. How many edges does a regular octahedron have?

A   12

B   16

C   17

D   24

End of Goal 2 Sample Items

Geometry Goal 2
Sample Items Key Report

1 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Applying **Correct Answer:** C

2 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Applying **Correct Answer:** B

3 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Applying **Correct Answer:** A

4 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Applying **Correct Answer:** C

5 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Analyzing **Correct Answer:** D

6 **Objective:** **2.01**
Use logic and deductive reasoning to draw conclusions and solve problems.
Thinking Skill: Applying **Correct Answer:** B

7 **Objective:** **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Applying **Correct Answer:** D

8 **Objective:** **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Analyzing **Correct Answer:** C

9 **Objective:** **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Analyzing **Correct Answer:** C

10   **Objective:**   **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Applying   **Correct Answer:**   C

11   **Objective:**   **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Analyzing   **Correct Answer:**   D

12   **Objective:**   **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Analyzing   **Correct Answer:**   B

13   **Objective:**   **2.02**
Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.
Thinking Skill: Applying   **Correct Answer:**   B

14   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Applying   **Correct Answer:**   B

15   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Analyzing   **Correct Answer:**   B

16   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Analyzing   **Correct Answer:**   C

17   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Analyzing   **Correct Answer:**   B

18   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Applying   **Correct Answer:**   B

19   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Integrating   **Correct Answer:**   B

20   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Applying   **Correct Answer:**   B

21   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Applying   **Correct Answer:**   B

22   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Organizing   **Correct Answer:**   A

23   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Integrating   **Correct Answer:**   D

24   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Applying   **Correct Answer:**   A

25   **Objective:**   **2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Analyzing   **Correct Answer:**   A

26   **Objective: 2.03**
Apply properties, definitions, and theorems of two-dimensional figures to solve
problems and write proofs: a) Triangles b) Quadrilaterals c) Other Polygons d) Circles
Thinking Skill: Organizing   **Correct Answer:**   D

27   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Organizing   **Correct Answer:**   D

28   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Analyzing   **Correct Answer:**   B

29   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Analyzing   **Correct Answer:**   C

30   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Analyzing   **Correct Answer:**   A

31   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Integrating   **Correct Answer:**   A

32   **Objective: 2.04**
Develop and apply properties of solids to solve problems.
Thinking Skill: Organizing   **Correct Answer:**   A