CLE: identify types of symmetries of 2- and 3-dimensional figures
DOK Level: 1

1. Which shape does not have any lines of symmetry?

A) 

B) 

C) 

D)
The lines shown below are parallel.

What is the value of $x$?

A) 35
B) 55
C) 110
D) 125
CLE: generalize patterns using explicitly or recursively defined functions
DOK Level: 2

3.
Which of these expressions represents the pattern for the number of cubes in figure $n$?

A) $\frac{n(n + 1)}{2}$

B) $\frac{n(n + 2)}{2}$

C) $n(n + 1)$

D) $n(n + 2)$
CLE: use and apply constructions and the coordinate plane to represent translations, reflections, rotations and dilations of objects
DOK Level: 1

4.
Given: \( \overline{AB} \) with coordinates of \( A(-3, -1) \) and \( B(2, 1) \)
\( \overline{A'B'} \) with coordinates of \( A'(1, 2) \) and \( B'(4, 4) \)

Which translation was used?

A) \((x, y) \rightarrow (x + 2, y + 3)\)

B) \((x, y) \rightarrow (x + 2, y - 3)\)

C) \((x, y) \rightarrow (x - 2, y + 3)\)

D) \((x, y) \rightarrow (x - 2, y - 3)\)
Given: \( \angle M \cong \angle N, \overline{LO} \cong \overline{PO} \)
Prove: \( \triangle MOL \cong \triangle NOP \)

<table>
<thead>
<tr>
<th>Statements</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) ( \angle M \cong \angle N )</td>
<td>1) Given</td>
</tr>
<tr>
<td>2) ( \overline{LO} \cong \overline{PO} )</td>
<td>2) Given</td>
</tr>
<tr>
<td>3) ( \angle MOL \cong \angle NOP )</td>
<td>3)</td>
</tr>
<tr>
<td>4) ( \triangle MOL \cong \triangle NOP )</td>
<td>4) AAS</td>
</tr>
</tbody>
</table>

Which of these reasons would be appropriate for statement 3?

A) reflexive property

B) definition of midpoint

C) Vertical angles are congruent.

D) Corresponding parts of congruent triangles are congruent.
Which diagram shows the top view of the solid below?

A) 

B) 

C) 

D)
7. Which statement is true about an equilateral triangle?

A) It has no rotational symmetry.

B) It has only rotational symmetry.

C) It has exactly 1 line of symmetry.

D) It has exactly 3 lines of symmetry.
8. Parallelogram ABCD is shown below.

What is the measure of $\angle ABC$?

A) $85^\circ$
B) $90^\circ$
C) $95^\circ$
D) $100^\circ$
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 2

9. Trapezoid TRAP is shown below.

What is the length of midsegment MN?

A) 10
B) \( \frac{25}{2} \)
C) \( \sqrt{234} \)
D) 100
10. Look at the letters below.

How many letters have a horizontal line of symmetry?

A) 3
B) 5
C) 6
D) 8
CLE: use inductive and deductive reasoning to establish the validity of geometric conjectures, prove theorems and critique arguments made by others

DOK Level: 3

11. Given: $\overline{AD} \parallel \overline{EC}$, $\overline{AD} \cong \overline{EC}$
Prove: $\overline{AB} \cong \overline{CB}$

Shown below are the statements and reasons for the proof. They are not in the correct order.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. $\triangle ABD \cong \triangle CBE$</td>
<td>I. AAS</td>
</tr>
<tr>
<td>II. $\angle ABD \cong \angle EBC$</td>
<td>II. Vertical angles are congruent.</td>
</tr>
<tr>
<td>III. $\overline{AD} \parallel \overline{EC}$, $\overline{AD} \cong \overline{EC}$</td>
<td>III. Given</td>
</tr>
<tr>
<td>IV. $\overline{AB} \cong \overline{CB}$</td>
<td>IV. Corresponding parts of congruent triangles are congruent.</td>
</tr>
<tr>
<td>V. $\angle DAB \cong \angle ECB$</td>
<td>V. If two parallel lines are cut by a transversal, the alternate interior angles are congruent.</td>
</tr>
</tbody>
</table>

Which of these is the most logical order for the statements and reasons?

A) I, II, III, IV, V
B) III, II, V, I, IV
C) III, II, V, IV, I
D) II, V, III, IV, I
What is the volume of the right cylinder below, in terms of $\pi$?

A) $120\pi$ cubic inches

B) $240\pi$ cubic inches

C) $1,200\pi$ cubic inches

D) $1,440\pi$ cubic inches
13. \( \triangle ABC \) with vertices at \( A(-4, 4) \), \( B(-3, -3) \) and \( C(-9, -1) \) is rotated \( 180^\circ \) counterclockwise about the origin.

What are the vertices of the image, \( \triangle A'B'C' \)?

A) \( A'(-4, 4), B'(-3, -3), C'(-9, -1) \)

B) \( A'(4, -4), B'(-3, -3), C'(-1, -9) \)

C) \( A'(4, -4), B'(3, 3), C'(9, 1) \)

D) \( A'(4, 4), B'(3, -3), C'(9, -1) \)
CLE: compare and contrast various forms of representations of patterns
DOK Level: 2

14.

Which table of values represents the line with the equation \( y = \frac{2}{3}x + 3 \)?

A) \[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
0 & 3 \\
2 & 6 \\
4 & 9 \\
\hline
\end{array}
\]

B) \[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
1 & -3 \\
2 & -\frac{3}{2} \\
3 & 0 \\
\hline
\end{array}
\]

C) \[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
-3 & 1 \\
0 & 3 \\
3 & 5 \\
\hline
\end{array}
\]

D) \[
\begin{array}{|c|c|}
\hline
x & y \\
\hline
0 & 3 \\
1 & \frac{5}{3} \\
2 & \frac{7}{3} \\
\hline
\end{array}
\]
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 2

15.
Mr. Smith and Ms. Jones start at the same place. Mr. Smith drives north for 4 miles. Ms. Jones drives east for 5 miles. What is the direct distance between Mr. Smith and Ms. Jones?

A) $\sqrt{18}$ miles

B) $\sqrt{41}$ miles

C) 9 miles

D) 41 miles
CLE: use inductive and deductive reasoning to establish the validity of geometric conjectures, prove theorems and critique arguments made by others
DOK Level: 3

16.
Given: \( \overline{XY} \) and \( \overline{ZW} \) intersect at point A.

Which conjecture is always true about the given statement?

A) \(XA = AY\)

B) \(\angle XAZ\) is acute.

C) \(\overline{XY}\) is perpendicular to \(\overline{ZW}\).

D) \(X, Y, Z, \) and \(W\) are noncollinear.
17. What is the measure of $\angle 1$ in the figure below?

A) $41^\circ$
B) $65^\circ$
C) $102^\circ$
D) $115^\circ$
CLE: draw and use vertex-edge graphs or networks to find optimal solutions and draw representations of 3-dimensional geometric objects from different perspectives

DOK Level: 2

18.
As a classroom warm-up problem, Ms. Hughes drew this network and asked her students to write down the path that showed traceability.

Which response shows the traceable path?

A) $\overline{CB}, \overline{BA}, \overline{AE}, \overline{ED}, \overline{CD}$

B) $\overline{BC}, \overline{CD}, \overline{DE}, \overline{EA}, \overline{AB}, \overline{BD}$

C) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{DE}, \overline{AE}, \overline{AB}, \overline{DB}$

D) $\overline{AE}, \overline{ED}, \overline{DB}, \overline{BC}, \overline{CD}, \overline{DB}, \overline{BA}$
CLE: use inductive and deductive reasoning to establish the validity of geometric conjectures, prove theorems and critique arguments made by others
DOK Level: 2

19. Look at the conditions below.
   1. If a quadrilateral has four right angles, then it is a rectangle.
   2. If a quadrilateral is a rectangle, then it could be a square.
   3. Quadrilateral ABCD has four right angles.
Using these conditions, which of these is a valid conclusion?

A) Quadrilateral ABCD must be a square.
B) Quadrilateral ABCD is not a rectangle.
C) Quadrilateral ABCD could be a square.
D) Quadrilateral ABCD could be a rectangle.
CLE: analyze linear functions by investigating rates of change and intercepts
DOK Level: 2

20.
What is the $y$-intercept of the equation $3x - 2y = 24$?

A) $(0, -12)$

B) $(0, -8)$

C) $(0, 8)$

D) $(0, 12)$
CLE: use and apply constructions and the coordinate plane to represent translations, reflections, rotations and dilations of objects
DOK Level: 2

21.
The point \((-7, 4)\) is reflected over the line \(x = -3\). Then, the resulting point is reflected over the line \(y = x\). Where is the point located after both reflections?

A) \((-10, -7)\)
B) \((1, 4)\)
C) \((4, -7)\)
D) \((4, 1)\)
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 2

22.
Parallelogram ABCD is graphed on the coordinate plane shown below.

What are the coordinates of point C?

A) \((x, y)\)

B) \((y, x + z)\)

C) \((x + z, y)\)

D) \((x - z, y)\)
An ice cream company needs to know how much ice cream can fit into its new ice cream cones.

Using 3.14 for \( \pi \), approximately how much ice cream will fill the cone level with the top?

A) 188 cm\(^3\)  
B) 314 cm\(^3\)  
C) 340 cm\(^3\)  
D) 942 cm\(^3\)
A network of electrical wires will be constructed so that each of the six points on the board is directly connected to each other point by a piece of wire. The diagram shows the board with points A, B, C, D, E, and F.

How many pieces of wire are needed to make the network?

A) 6
B) 10
C) 15
D) 30
2009 Geometry SR (Released Form)

CLE: identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem
DOK Level: 2

25.
The table shows prices for different numbers of pencils. The price continues to increase in this pattern.

<table>
<thead>
<tr>
<th>Number of Pencils</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>$0.60</td>
</tr>
<tr>
<td>10</td>
<td>$1.20</td>
</tr>
<tr>
<td>24</td>
<td>$2.88</td>
</tr>
</tbody>
</table>

\[ x = \text{number of pencils} \]
\[ y = \text{total price} \]

Which equation models this situation?

A) \( y = 0.12x \)
B) \( y = 0.6x \)
C) \( y = 0.12x + 5 \)
D) \( y = 0.6x + 5 \)
2009 Geometry SR (Released Form)

CLE: use inductive and deductive reasoning to establish the validity of geometric conjectures, prove theorems and critique arguments made by others
DOK Level: 1

26.
Given the diagram below, what information is needed to prove that the lines are parallel?

A) \( m \angle 1 = m \angle 3 \)

B) \( m \angle 1 = m \angle 6 \)

C) \( m \angle 1 = m \angle 7 \)

D) \( m \angle 1 = m \angle 8 \)
The graph below shows the distance, as a function of time, for two runners.

Which runner was faster, and by how much?

A) runner A, by 2 miles per hour
B) runner B, by 2 miles per hour
C) runner A, by 4 miles per hour
D) runner B, by 4 miles per hour
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates  
DOK Level: 2  

28.  
Kristina plots a triangle with vertices $(-2, 3)$, $(0, 0)$, and $(6, 4)$ on a coordinate plane. If each unit on the coordinate plane represents one meter (m), what is the perimeter of her triangle, to the nearest tenth of a meter?  

A) 11.6 m  
B) 15.3 m  
C) 18.9 m  
D) 22.8 m
What is the volume of the cube shown below?

A) $18a$
B) $18a^3$
C) $216a$
D) $216a^3$
30.

In the figure below, \( k \parallel m \).

What is the value of \( y \)?

A) \( y = 15 \)

B) \( y = 70 \)

C) \( y = 115 \)

D) \( y = 120 \)
31.
If both of the statements below are true, which statement is a logical conclusion?

Some triangles are isosceles triangles.
All isosceles triangles have two congruent sides.

A) All triangles have two congruent sides.
B) Some triangles have two congruent sides.
C) Some isosceles triangles have three congruent sides.
D) All figures with two congruent sides are isosceles triangles.
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 2

32.
Which classification describes $\triangle MNO$ with vertices $M(2, -3), N(3, 1)$, and $O(-3, 1)$?

A) equilateral
B) isosceles
C) right
D) scalene
33.
A family invested \$2,000 into an account that pays 2% interest compounded annually. In the functions below, \( x \) = time in years and \( y \) = total amount in the account after \( x \) years.

\[
y = 40x + 2,000
\]

\[
y = 2,000(1.02)^x
\]

Use the function that models the situation correctly. To the nearest dollar, how much money is in the family's account after 5 years?

A) \$2,081
B) \$2,200
C) \$2,208
D) \$10,200
CLE: draw and use vertex-edge graphs or networks to find optimal solutions and draw representations of 3-dimensional geometric objects from different perspectives

DOK Level: 2

34.
The numbers in the drawing below represent distance, in miles, between towns.

If Scott is at Town B, what is the shortest possible route he can take from Town B to Town G if he must travel through Town C?

A) 57 miles
B) 58 miles
C) 64 miles
D) 70 miles
What is the surface area of the solid shown below?

A) 72 cm²
B) 144 cm²
C) 156 cm²
D) 184 cm²
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 2

36.
Two students started at the coordinate (0, 0). Student A walked 7 units east and 5 units south. Student B walked 4 units west and 1 unit south. How many units apart are the students?

A) 11
B) \sqrt{137}
C) \sqrt{153}
D) \sqrt{157}
CLE: draw and use vertex-edge graphs or networks to find optimal solutions and draw representations of 3-dimensional geometric objects from different perspectives
DOK Level: 3

37.
A school district has the following high school committee officers.
- Committee A: Amber, Calipso, Juan
- Committee B: Megan, Amber, Sam
- Committee C: Calipso, Sam, Amanda
- Committee D: Jerrad, Roberto, Danielle, Juan

The committees are represented with vertices. If two committees share a person, connect the vertices with an edge. Which graph will allow all committee members to attend the meetings to which they are assigned?

A) A B
   D C

B) A B
   D C

C) A B
   D C

D) A B
   D C
38.
The figure below shows a pattern of dots.

Which equation models the number of dots in the \( n \)th term?

\[ n = \text{term number} \]
\[ a_n = \text{number of dots in the } n\text{th term} \]

A) \( a_n = 5n \)
B) \( a_n = 2n + 3 \)
C) \( a_n = 2n + 5 \)
D) \( a_n = 3n + 2 \)
CLE: make conjectures and solve problems involving 2-dimensional objects represented with Cartesian coordinates
DOK Level: 3

39.
On a coordinate plane, a shape is plotted with vertices of (3, 1), (0, 4), (3, 7), and (6, 4). What is the area of the shape if each grid unit equals one centimeter?

A) 18 cm²
B) 24 cm²
C) 36 cm²
D) 42 cm²
CLE: determine the surface area and volume of geometric figures, including cones, spheres, and cylinders

DOK Level: 2

40.
A company makes sealed metal water tanks, as shown below.

To the nearest square meter, how much sheet metal does the company need to make one tank?

A) 314 m$^2$

B) 471 m$^2$

C) 785 m$^2$

D) 942 m$^2$