END OF COURSE
GEOMETRY

CORE 1

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Geometry Formula Sheet

Geometric Formulas

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<th>Meaning</th>
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<th>Meaning</th>
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<tr>
<td>∠A</td>
<td>angle A</td>
<td>( \overrightarrow{AB} )</td>
<td>vector ( AB )</td>
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<tr>
<td>m∠A</td>
<td>measure of angle A</td>
<td>( \overrightarrow{AB} \parallel \overrightarrow{CD} )</td>
<td>Line ( AB ) is parallel to line ( CD ).</td>
</tr>
<tr>
<td>( \overline{AB} )</td>
<td>line segment ( AB )</td>
<td>( \overrightarrow{AB} \perp \overrightarrow{CD} )</td>
<td>Line ( AB ) is perpendicular to line ( CD ).</td>
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<tr>
<td>( \overrightarrow{AB} )</td>
<td>measure of line segment ( AB )</td>
<td>( \triangle A \cong \triangle B )</td>
<td>Angle ( A ) is congruent to angle ( B ).</td>
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<tr>
<td>( \triangle ABC )</td>
<td>triangle ( ABC )</td>
<td>( \triangle A \sim \triangle B )</td>
<td>Triangle ( A ) is similar to triangle ( B ).</td>
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<tr>
<td>( \square ABCD )</td>
<td>rectangle ( ABCD )</td>
<td>Similarly marked segments are congruent.</td>
<td></td>
</tr>
<tr>
<td>( \Box ABCD )</td>
<td>parallelogram ( ABCD )</td>
<td>Similarly marked angles are congruent.</td>
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Abbreviations

<table>
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<th>Abbreviation</th>
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<tr>
<td>( V )</td>
<td>Volume</td>
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<tr>
<td>( L.A. )</td>
<td>Lateral Area</td>
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<tr>
<td>( S.A. )</td>
<td>Total Surface Area</td>
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<tr>
<td>( B )</td>
<td>Area of Base</td>
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\( \pi \approx 3.14 \)

\( \pi \approx \frac{22}{7} \)
DIRECTIONS
Read and solve each question. Then mark the space on the answer sheet for the best answer.

SAMPLE

If ΔABC is similar to ΔADE, then AB : AD = ? : AE. Which replaces the “?” to make the statement true?

A  AC
B  AE
C  DE
D  BC

1 The measures of some angles are given in the figure.

What is the value of x?

A  65
B  70
C  80
D  85

2 The figure shows line l intersecting lines r and s.

In the figure, ∠1 and ∠2 are —

F  alternate interior angles
G  alternate exterior angles
H  corresponding angles
J  consecutive interior angles
3. The Department of Transportation wants to extend the intersecting road across the highway, as indicated by the dotted line.

What should $x$ be to ensure that the intersecting road and the new construction form a straight line?

A. $35^\circ$  
B. $55^\circ$  
C. $105^\circ$  
D. $125^\circ$

4. The polygon shown is convex.

The sum of its interior angle measures is —

F. $900^\circ$  
G. $1,260^\circ$  
H. $1,620^\circ$  
J. $2,520^\circ$

5. Which statement would be sufficient to prove that line $l$ is parallel to line $m$?

A. $\overline{AC} \perp m$  
B. $\overline{AB} \perp l$  
C. $\overline{AC} \perp l$  
D. $\overline{AB} \perp \overline{AC}$
6. In this diagram, line \(d\) cuts three lines to form the angles shown.

Which two lines are parallel?

F. \(a\) and \(b\)
G. \(a\) and \(c\)
H. \(b\) and \(c\)
J. No lines are parallel.

7. Quadrilateral \(QRST\) is placed on a coordinate grid as shown.

What coordinates for \(S\) make \(QRST\) a parallelogram?

A. \((8, 6)\)
B. \((8, 10)\)
C. \((12, 6)\)
D. \((12, 10)\)

8. Which condition will guarantee that line \(l\) is parallel to line \(m\)?

F. \(\angle 1 \equiv \angle 3\)
G. \(\angle 1 \equiv \angle 6\)
H. \(\angle 6 \equiv \angle 5\)
J. \(\angle 3 \equiv \angle 5\)
The drawing shows a compass and straightedge construction of —

A  a perpendicular to a given line from a point not on the line
B  a perpendicular to a given line at a point on the line
C  the bisector of a given angle
D  an angle congruent to a given angle

Which point would be on a line perpendicular to \( l \) through \( T \)?

F  W
G  X
H  Y
J  Z

To which point should a line segment from \( A \) be drawn so that the resulting figure is a rectangle?

A  W
B  X
C  Y
D  Z

\( \triangle XYZ \) is similar to \( \triangle STR \). \( XY = 6 \) and \( ST = 12 \). If the perimeter of \( \triangle STR \) is 38, then what is the perimeter of \( \triangle XYZ \)?

F  19
G  38
H  52
J  76
13 Let $p$ represent

$$\sqrt{\Pi} = z ,$$

and let $q$ represent

$z$ is a rational number.

Which is a representation of the statement below?

**If $\sqrt{\Pi} = z$, then $z$ is not a rational number.**

A $\sim p \rightarrow \sim q$
B $p \rightarrow q$
C $p \rightarrow \sim q$
D $\sim q \rightarrow \sim p$

---

14 **Isosceles Triangles**

**Equilateral Triangles**

According to the Venn diagram, which statement is true?

F All isosceles triangles are also equilateral triangles.
G All equilateral triangles are also isosceles triangles.
H Some equilateral triangles are also isosceles triangles.
J No isosceles triangles are equilateral triangles.

---

15 Which of the following statements represents a valid argument?

A If $a > b$ and $a > c$, then $b > c$.  
B If $a > b$ and $b > c$, then $a > c$.  
C If $a < b$ and $b > c$, then $c < b$.  
D If $a > b$ and $a > c$, then $a > b + c$.

---

16 Given: $\angle AXY \equiv \angle ABC$  
$\angle AYX \equiv \angle ACB$

Which is a true proportion?

F $\frac{AX}{AB} = \frac{AY}{AC} = \frac{XY}{BC}$
G $\frac{AX}{XB} = \frac{AY}{YC} = \frac{XY}{BC}$
H $\frac{XB}{AX} = \frac{YC}{AY} = \frac{BC}{XY}$
J $\frac{AX}{AB} = \frac{AC}{AY} = \frac{XY}{BC}$
17 Given: $AD$ and $BC$ intersect at $X$

$AX = XB$
$CX = XD$

Which congruency statement is true?

A $\angle ACX \equiv \angle BXD$
B $\angle ACX \equiv \angle DXB$
C $\angle ACX \equiv \angle BDX$
D $\angle ACX \equiv \angle DBX$

18 Which list could not be the measures of lengths of the three sides of a given triangle?

F 5 cm, 12 cm, 15 cm
G 2 ft, 6 ft, 5 ft
H 11 mi, 4 mi, 12 mi
J 12 yd, 35 yd, 20 yd

19 In the drawing of triangle $XYZ$, which angle has the least measure?

A All angles have the same measure.
B $\angle XYZ$
C $\angle ZXY$
D $\angle XZY$

20 If $m\angle A = 65^\circ$, $m\angle B = 15^\circ$, $m\angle C = 100^\circ$, which lists the sides of the triangle in order from shortest to longest?

F $AC, AB, BC$
G $BA, BC, AC$
H $BA, AC, BC$
J $AC, BC, BA$
21 A windlass is used to pull a boat to the dock. The rope is attached to the boat at a point 7 feet below the level of the windlass.

What is the distance from the boat to the dock when the rope is 25 feet?

A 25 ft  
B 24 ft  
C 18 ft  
D 7 ft

22 The parallelogram has the measurements shown.

Which is closest to the length of the altitude, \( h \)?

F 19.63
G 8.91
H 8.67
J 6.81

23

For the triangle represented by the above drawing, what is the length of \( XZ \)?

A \( 7.5\sqrt{2} \)
B \( 7.5\sqrt{3} \)
C \( 15\sqrt{2} \)
D \( 15\sqrt{3} \)

24

In rectangle \( ABCD \), which of the following pairs of segments are not necessarily congruent?

F \( BD \) and \( AC \)
G \( AB \) and \( CD \)
H \( BC \) and \( DC \)
J \( BE \) and \( CE \)
25 The town plaza in a certain town is a parallelogram. The town’s planning committee has decided to build a fountain at the center of the plaza. This sketch shows the corner points when placed on a coordinate grid.

Which coordinates show where the fountain will be located?
A \((2, 0.5)\)
B \((0.5, 2)\)
C \((3, 1.5)\)
D \((1.5, 1)\)

26 Quadrilateral \(ABCD\) is a parallelogram.

Which of the following must be true?
F \(AB \equiv AD\)
G \(AC \equiv BD\)
H \(\angle A \equiv \angle D\)
J \(\angle B \equiv \angle D\)

27 \(ABCD\) is a rhombus.

What is the measure of \(\angle CBD\)?
A \(50^\circ\)
B \(60^\circ\)
C \(70^\circ\)
D \(75^\circ\)
28 If each interior angle of a regular polygon measures 120°, how many sides does the polygon have?

F 14  
G 12  
H 8  
J 6

29 Which angle measure below is not a possible measure of an exterior angle of a regular polygon?

A 36°  
B 40°  
C 45°  
D 54°

30 In the figure, what is the measure of ∠C?

F 70°  
G 90°  
H 100°  
J 110°

31 TV is a diameter of circle Z.

What is the value of x?

A 4  
B 6  
C 8  
D 10

32 If AP = 8 and PC = 4, what is the measure of AB, the diameter of this circle?

F 2  
G 4  
H 6  
J 8
33  \( TW \) is a diameter of circle \( X \), and \( TW \) is parallel to \( UV \).

If the measure of \( TU \) is 25°, what is the degree measure of \( UV \)?

A  115°  
B  130°  
C  155°  
D  210°

34  This is a scale drawing of a tent where 1 centimeter represents 0.5 meter.

What is the height of the tent at its highest point?

F  10 m  
G  5 m  
H  3 m  
J  2.5 m
35 Which represents a two-dimensional view from directly above the figure?

A  

B  

C  

D  

36 To the nearest gallon, what is the volume of a cylindrical water heater 1.4 feet in diameter and 4 feet tall? (1 cubic foot = 7.48 gallons)

F  34 gal  
G  46 gal  
H  59 gal  
J  132 gal

37 A spherical paintball measures 1.5 centimeters in diameter. Approximately how much paint is in it?

A  1.77 cm³  
B  7.07 cm³  
C  9.42 cm³  
D  14.13 cm³

38 Which proportion can be used to find the value of PR if ΔXMQ is similar to ΔPRS?

F  \[
\frac{20}{15} = \frac{14}{PR}
\]

G  \[
\frac{10}{5} = \frac{7}{PR}
\]

H  \[
\frac{14}{20} = \frac{15}{PR}
\]

J  \[
\frac{15}{20} = \frac{14}{PR}
\]
When standing upright, Gary knows his eyes are 6 feet above ground level. To determine the depth of a well, he stands in the position shown.

Using the given measures, how deep is the well?

A  12 ft
B  14 ft
C  16 ft
D  18 ft

The coordinates of the midpoint of $\overline{AB}$ are —

F  (5, 3)
G  (-5, 3)
H  (2, 5)
J  (-2, 5)
41 Parallelogram $ABCD$ is placed on a coordinate grid as shown.

What is the approximate length of diagonal $AC$?

A  3.0 units  
B  5.4 units  
C  9.0 units  
D  10.6 units

42 Triangle $A'B'C'$ is —

F  a translation of triangle $ABC$ across the $y$-axis  
G  a 90° clockwise rotation of triangle $ABC$ about the origin  
H  a reflection of triangle $ABC$ across the $y$-axis  
J  a reflection of triangle $ABC$ across the $x$-axis
43. How many different lines of symmetry does a square have?
   A. 1
   B. 2
   C. 3
   D. 4

44. Which is most likely the slope of the line graphed?
   F. \(-4\)
   G. \(-\frac{3}{2}\)
   H. \(-\frac{2}{3}\)
   J. 4
Hexagon $ABCDEF$ is apparently symmetric with respect to —

A. point $P$ only
B. line $m$ only
C. line $l$ only
D. both lines $l$ and $m$ only
# Answer Key

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