# Geometry Cumulative Study Guide

Test 16

Numeric Response

1. Use a calculator to evaluate the expression sin 73°. Round to the nearest hundredth.

2. Find the volume, in cubic centimeters, of a tetrahedron, a regular triangular pyramid where all faces are congruent, with a base area of 5.4 square centimeters and a height of 2.95 centimeters.

3. The rule for the number of line segments, L, between n noncollinear points, in terms of the number of line segments between $n - 1$ points (denoted L_{n-1}), is $L_n = L_{n-1} + (n-1)$. How many line segments can be drawn between 12 noncollinear points?

4. In the diagram, $\odot A$ is tangent to $\odot C$, and $\overline{BD}$ is tangent to $\odot A$. The radius of $\odot A$ is 7 meters, and the radius of $\odot C$ is 4 meters. Find the area of $\triangle ADB$ to the nearest square meter.
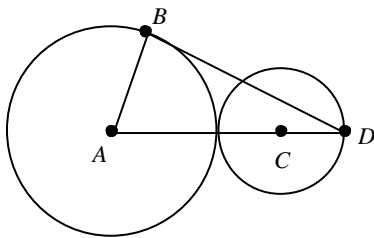

5. A person on top of a 44-meter water tower sees a car below. If the angle of depression between the top of the water tower to the car below is 30°, how far, in meters, is the person from the car?

6. Calculate the lateral area, in square inches, of a right cone with a radius of 7 inches and a slant height of 17 inches to the nearest hundredth square inch.
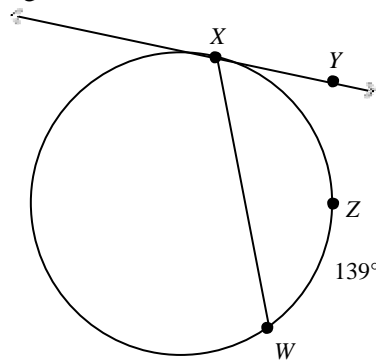
Problem

7. Find the lateral area of a cylinder with a radius of 4 inches and a height of 18 inches in terms of π.
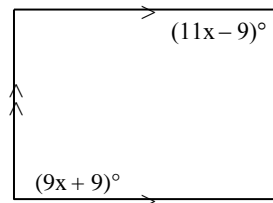
8. Add the equal vectors $\vec{p}$, $\vec{q}$, and $\vec{r}$ shown below.
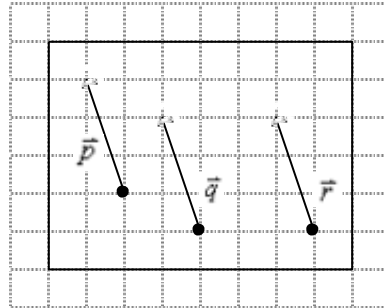
9. In the diagram below, find $m\angle WXY$, given that $\overleftrightarrow{XY}$ is a tangent.
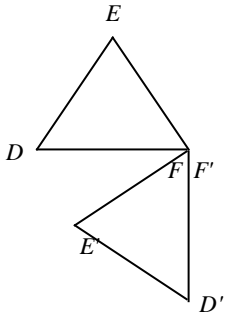

10. Is the parallelogram shown below a rectangle?

11. Mary is painting the floor of a gazebo that is in the shape of a regular hexagon with 8-foot side lengths. What is the total area that must be painted?
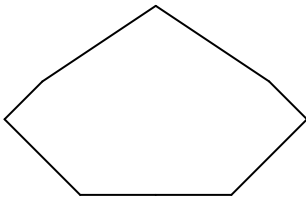
12. Identify the type of transformation illustrated below.

13. The vertices of a triangle are $E(-2, 1)$, $F(-4, -3)$, and $G(-5, 0)$. Find the image of $\triangle EFG$ after the translation $T : (x, y) \rightarrow (x + 2, y + 3)$. Show the preimage and image on the same coordinate grid.
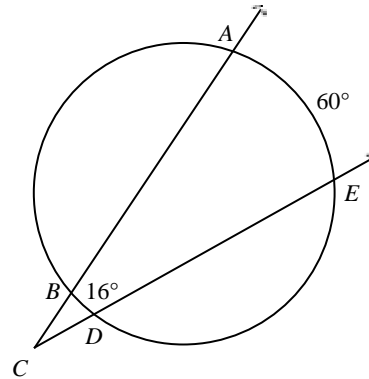
14. The equation of $\odot A$ is $x^2 + y^2 = 36$. Graph $\odot A$.

15. Identify whether the figure below has a line of symmetry. If it does, draw the line of symmetry.

16. If triangle $\triangle ABC$ has vertices $A(0, 2)$, $B(-3, 2)$, and $C(-2, 0)$, graph the triangle and its rotation $180°$ counterclockwise about the origin.

17. Find $m\angle C$ in the diagram below.

18. Find the surface area of a sphere with a 12-foot radius in terms of π.

19. Find the lengths of the sides of kite $ABCD$ shown below. Round to the nearest tenth.
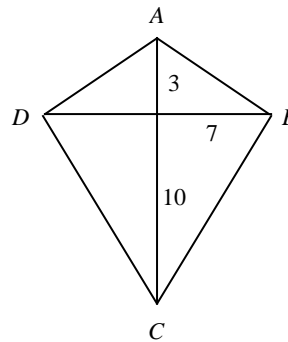
20. Rectangle $ABCD$ has vertices at $A(-2, 1)$, $B(4, 1)$, $C(4, -1)$, and $D(-2, -1)$. Reflect $ABCD$ across the line $y = -2$. Identify the coordinates of the vertices of the reflected image.

Geometry Cumulative Study Guide Test 16
Answer Section

NUMERIC RESPONSE

1. ANS: 0.96

    PTS: 1   REF: Lesson 68: Introduction to Trigonometric Ratios
    NAT: NCTM G.1d   TOP: Cumulative Test 16   MSC: Geom_S07_00056
2. ANS: 5.31

    PTS: 1   REF: Lesson 70: Finding Surface Areas and Volumes of Pyramids
    NAT: NCTM M.2b   TOP: Cumulative Test 16
    MSC: Geom_S07_00064
3. ANS: 66

    PTS: 1   REF: Investigation 8: Patterns   NAT: NCTM PS.1a
    TOP: Cumulative Test 16   MSC: Geom_S08_00058
4. ANS: 46

    PTS: 1   REF: Lesson 72: Tangents and Circles, Part 2
    NAT: NCTM M.2b   TOP: Cumulative Test 16
    MSC: Geom_S08_00059
5. ANS: 88

    PTS: 1   REF: Lesson 73: Applying Trigonometry: Angles of Elevation and Depression
    NAT: NCTM G.1d   TOP: Cumulative Test 16   MSC: Geom_S08_00061
6. ANS: 373.85

    PTS: 1   REF: Lesson 77: Finding Surface Areas and Volumes of Cones
    NAT: NCTM M.2b   TOP: Cumulative Test 16
    MSC: Geom_S08_00064

PROBLEM

7. ANS:
    $L = 144\,\pi$ square inches

    PTS: 1   REF: Lesson 62: Finding Surface Areas and Volumes of Cylinders
    NAT: NCTM M.2b   TOP: Cumulative Test 16
    MSC: Geom_S07_00073
8. ANS:
    $\langle -3, 9 \rangle$

    PTS: 1   REF: Lesson 63: Introduction to Vectors   NAT: NCTM NO.3a
    TOP: Cumulative Test 16   MSC: Geom_S07_00077

9. ANS:
   $m\angle WXY = 69.5°$

   PTS: 1   REF: Lesson 64: Angles Interior to Circles
   NAT: NCTM G.1d   TOP: Cumulative Test 16   MSC: Geom_S07_00080

10. ANS:
    Yes; $x = 9$, so the angles are 90°.

    PTS: 1   REF: Lesson 65: Distinguishing Types of Parallelograms
    NAT: NCTM G.1a   TOP: Cumulative Test 16   MSC: Geom_S07_00084
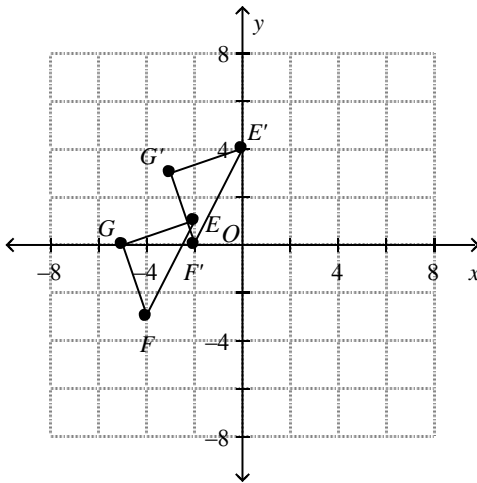
11. ANS:
    $A = 96\sqrt{3}$ square feet

    PTS: 1   REF: Lesson 66: Finding Perimeters and Areas of Regular Polygons
    NAT: NCTM M.2b   TOP: Cumulative Test 16
    MSC: Geom_S07_00087

12. ANS:
    $\triangle DEF$ is rotated clockwise about point F.
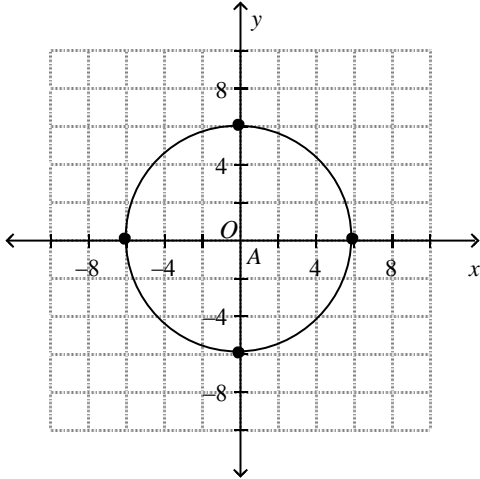
    PTS: 1   REF: Lesson 67: Introduction to Transformations
    NAT: NCTM G.3b   TOP: Cumulative Test 16   MSC: Geom_S07_00093

13. ANS:
    $E(-2, 1) \rightarrow E'(0, 4)$

    $F(-4, -3) \rightarrow F'(-2, 0)$

    $G(-5, 0) \rightarrow G'(-3, 3)$

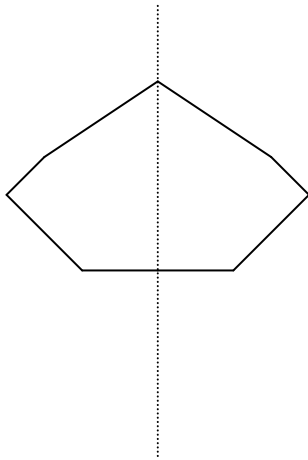

    PTS: 1   REF: Lesson 71: Translations   NAT: NCTM G.3a
    TOP: Cumulative Test 16   MSC: Geom_S08_00072

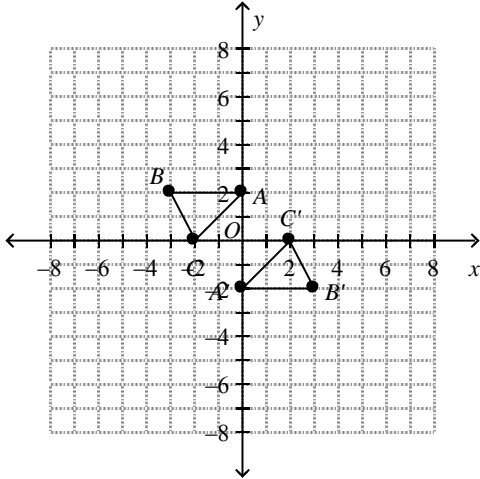14. ANS:

PTS: 1   REF: Lesson 75: Writing the Equation of a Circle
NAT: NCTM A.2b   TOP: Cumulative Test 16   MSC: Geom_S08_00083

15. ANS:

PTS: 1   REF: Lesson 76: Symmetry   NAT: NCTM G.1a
TOP: Cumulative Test 16   MSC: Geom_S08_00087

16. ANS:

PTS: 1   REF: Lesson 78: Rotations   NAT: NCTM G.2a
TOP: Cumulative Test 16   MSC: Geom_S08_00092

17. ANS:

$m\angle C = 22°$

PTS: 1   REF: Lesson 79: Angles Exterior to Circles
NAT: NCTM G.1d   TOP: Cumulative Test 16   MSC: Geom_S08_00096
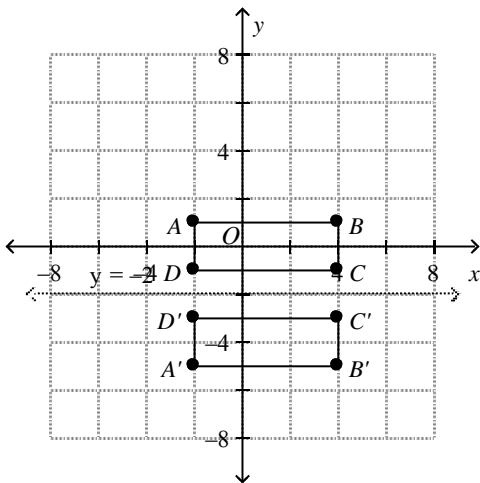
18. ANS:

$S = 576\pi$ square feet

PTS: 1   REF: Lesson 80: Finding Surface Areas and Volumes of Spheres
NAT: NCTM M.2b   TOP: Cumulative Test 16
MSC: Geom_S08_00099

19. ANS:

$AB \approx 7.6$, $AD \approx 7.6$, $CB \approx 12.2$, $CD \approx 12.2$

PTS: 1   REF: Lesson 69: Properties of Trapezoids and Kites
NAT: NCTM G.1a   TOP: Cumulative Test 16   MSC: Geom_S07_00098

20. ANS:

$A'(-2, -5)$, $B'(4, -5)$, $C'(4, -3)$, and $D'(-2, -3)$

PTS: 1 REF: Lesson 74: Reflections NAT: NCTM G.3a
TOP: Cumulative Test 16 MSC: Geom_S08_00080