## Geometry Unit Test Prep

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question. You must show work to get full credit

Find the area. The figure is not drawn to scale.

_____ 1.

47 in.

34 in. | 24 in.
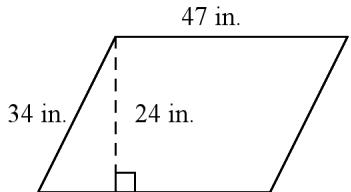
a. 1128 in.^{2} b. 142 in.^{2} c. 1598 in.^{2} d. 71 in.^{2}

_____ 2.

8 in.

7 in.   8 in.
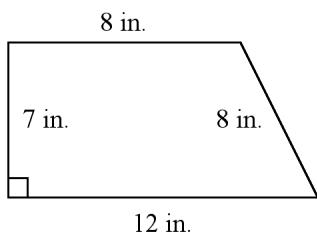
12 in.
Not drawn to scale

a. 77.2 in.^{2} b. 80 in.^{2} c. 75 in.^{2} d. 70 in.^{2}

_____ 3.

9 cm

8 cm

13 cm

9 cm   11 cm
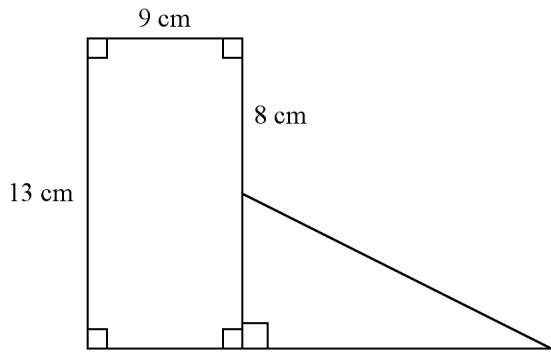
a. 144.5 cm^2 b. 127 cm^2 c. 172 cm^2 d. 50 cm^2

Find the area of the trapezoid. Leave your answer in simplest radical form.

_____ 4. A kite has diagonals 6.5 ft and 6 ft. What is the area of the kite?
     a. 25 ft^2 b. 6.25 ft^2 c. 39 ft^2 d. 19.5 ft^2

_____ 5.

6 cm

8 cm

45°

3 cm
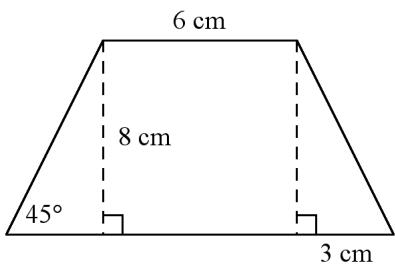
Not drawn to scale

a.   36 cm²   b.   96 cm²   c.   11.5 cm²   d.   92 cm²

_____ 6. Given the regular hexagon, find the measure of each numbered angle.

3

1

2
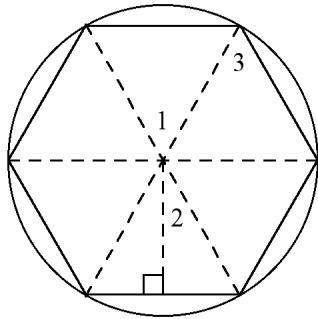
a. $m\angle 1 = 30$, $m\angle 2 = 60$, $m\angle 3 = 30$ c. $m\angle 1 = 60$, $m\angle 2 = 30$, $m\angle 3 = 60$
b. $m\angle 1 = m\angle 2 = m\angle 3 = 60$ d. $m\angle 1 = 60$, $m\angle 2 = 30$, $m\angle 3 = 30$

_____ 7. Find the area of a regular hexagon with side length of 8 cm. Round your answer to the nearest tenth.
a.   55.4 cm²   b.   288 cm²   c.   83.1 cm²   d.   166.3 cm²

_____ 8. You are planning to use a ceramic tile design in your new bathroom. The tiles are blue and white equilateral triangles. You decide to arrange the blue tiles in a hexagonal shape as shown. If the side of each tile measures 10 centimeters, what will be the exact area of each hexagonal shape?

10 cm
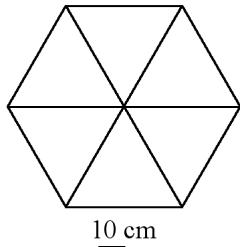
a. $200\sqrt{3}$ cm²   b.   30 cm²   c. $150\sqrt{3}$ cm²   d.   3000 cm²

_____ 9. The widths of two similar rectangles are 36 ft and 32 ft. What is the ratio of the perimeters? Of the areas?
a.   10 : 9 and 100 : 81   c.   9 : 8 and 81 : 64
b.   10 : 9 and 81 : 64   d.   9 : 8 and 100 : 81

Find the area of the regular polygon. Give the answer to the nearest tenth.

____ 10. pentagon with side 8 ft

     a.   22 ft^2 b.   110.1 ft^2 c.   88.1 ft^2 d.   220.2 ft^2

____ 11. hexagon with side 4 ft

     a.   6 ft^2 b.   20.8 ft^2 c.   41.6 ft^2 d.   83.1 ft^2

____ 12. decagon with side 4 cm

     a.   123.1 cm^2 b.   129.4 cm^2 c.   246.2 cm^2 d.   139.8 cm^2

Find the area of the triangle. Give the answer to the nearest tenth. The drawing may not be to scale.

____ 13.
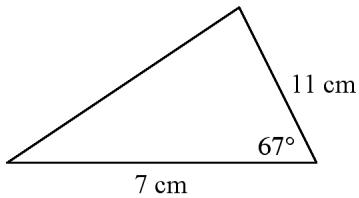
     a.   35.4 cm^2 b.   15 cm^2 c.   90.7 cm^2 d.   70.9 cm^2

____ 14.
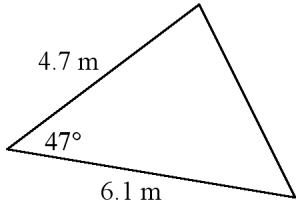
     a.   10.5 m^2 b.   9.8 m^2 c.   19.6 m^2 d.   21.0 m^2

____ 15. Grade 7 students were surveyed to determine how many hours a day they spent on various activities. The results are shown in the circle graph below. Find the measure of each central angle in the circle graph.
a. Sleeping
b. Eating

How Students Spend Their Time

WatchingTV 13%   Socializing 13%
Homework 8%
Eating 8%
School 25%
Sleeping 33%
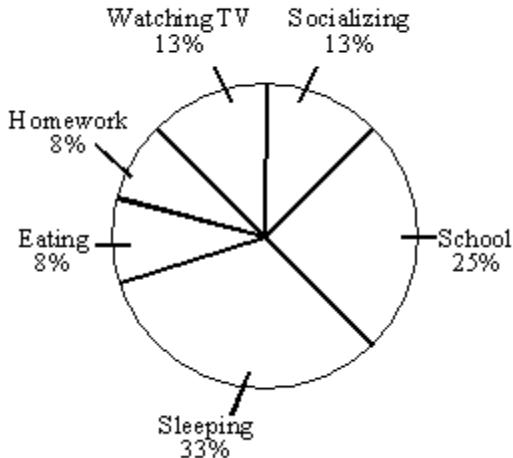
 a. 118.8°; 28.8°   b. 108°; 28.8°   c. 118.8°; 288°   d. 59.4°; 288°

Find the circumference. Leave your answer in terms of π.

____ 16.
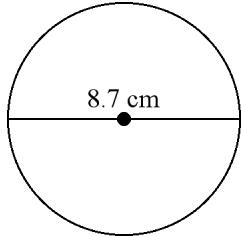
8.7 cm

 a. 17.4π cm   b. 4.35π cm   c. 8.7π cm   d. 13.05π cm

____ 17. Find the length of arc *XPY*. Leave your answer in terms of π.

X
Y
4 m
P
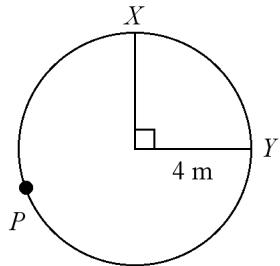
 a. 12π m   b. 360π m   c. 6π m   d. 2π m

Find the area of the circle. Leave your answer in terms of π.

____ 18.

    a.   64.98π m²   b.   32.49π m²   c.   185.19π m²   d.   2.85π m²

____ 19.
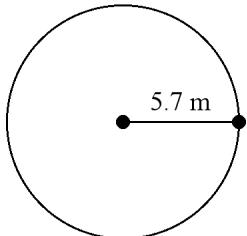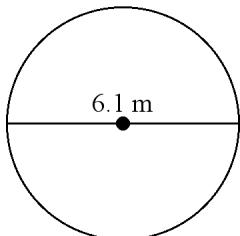
    a.   9.3025π m²   b.   37.21π m²   c.   18.605π m²   d.   15.2π m²

____ 20. Given a regular nonagon, find the measures of the angles formed by (a) two consecutive radii and (b) a radius and a side of the polygon.
    a.   36°; 234°   b.   40°; 70°   c.   60°; 240°   d.   72°; 252°

____ 21. Two triangles each have adjacent sides of length 120 feet and 180 feet. The first triangle has an angle between the two sides of 40°, while the second triangle has an angle between the two sides of 60°. What is the approximate difference between the areas of the two triangles?
    a.   4822 ft^2 b.   2873 ft^2 c.   5746 ft^2 d.   2411 ft^2

____ 22. The circumference of a circle is 46π cm. Find the diameter, the radius, and the length of an arc of 70°.
    a.   46 cm; 92 cm; 4.5π cm   c.   23 cm; 46 cm; 4.5π cm
    b.   92 cm; 23 cm; 125π cm   d.   46 cm; 23 cm; 8.9π cm

____ 23. A team in science class placed a chalk mark on the side of a wheel and rolled the wheel in a straight line until the chalk mark returned to the same position. The team then measured the distance the wheel had rolled and found it to be 10 cm. To the nearest tenth, what is the area of the wheel?
    a.   15.9 cm²   b.   8 cm²   c.   31.8 cm²   d.   7.9 cm²

Essay

1. The diameter of a basketball rim is 18 inches. A standard basketball has a circumference of 30 inches. About how much room is there between the ball and the rim in a shot in which the ball goes in exactly in the center of the rim? Show your work.

Reasoning and Writing in Math

1. Explain why the radius of a regular polygon is greater than the apothem.

Geometry Unit Test Prep
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1 DIF: L2
    REF: 10-1 Areas of Parallelograms and Triangles OBJ: 10-1.1 Area of a Parallelogram
    TOP: 10-1 Example 1 KEY: area | parallelogram | base | height
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
2. ANS: D PTS: 1 DIF: L2
    REF: 10-2 Areas of Trapezoids, Rhombuses, and Kites OBJ: 10-2.1 Area of a Trapezoid
    TOP: 10-2 Example 1 KEY: trapezoid | area
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
3. ANS: A PTS: 1 DIF: L3
    REF: 10-1 Areas of Parallelograms and Triangles OBJ: 10-1.2 Area of a Triangle
    TOP: 10-1 Example 3 KEY: area | triangle | rectangle
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
4. ANS: D PTS: 1 DIF: L2
    REF: 10-2 Areas of Trapezoids, Rhombuses, and Kites
    OBJ: 10-2.2 Finding Areas of Rhombuses and Kites TOP: 10-2 Example 3
    KEY: area | kite
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
5. ANS: D PTS: 1 DIF: L3
    REF: 10-2 Areas of Trapezoids, Rhombuses, and Kites OBJ: 10-2.1 Area of a Trapezoid
    TOP: 10-2 Example 2 KEY: area | trapezoid
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
6. ANS: C PTS: 1 DIF: L2 REF: 10-3 Areas of Regular Polygons
    OBJ: 10-3.1 Areas of Regular Polygons TOP: 10-3 Example 1
    KEY: regular polygon
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
7. ANS: D PTS: 1 DIF: L2 REF: 10-3 Areas of Regular Polygons
    OBJ: 10-3.1 Areas of Regular Polygons TOP: 10-3 Example 3
    KEY: regular polygon | hexagon | area | apothem | radius
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52

8. ANS: C   PTS: 1   DIF: L2   REF: 10-3 Areas of Regular Polygons
    OBJ: 10-3.1 Areas of Regular Polygons   TOP: 10-3 Example 3
    KEY: regular polygon | hexagon | area | apothem | radius | word problem | problem solving
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52

9. ANS: C   PTS: 1   DIF: L2
    REF: 10-4 Perimeters and Areas of Similar Figures
    OBJ: 10-4.1 Finding Perimeters and Areas of Similar Figures   TOP: 10-4 Example 1
    KEY: perimeter | area | similar figures
    MSC: NAEP M2g | NAEP N4c | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM |
    IT.LV16.CP | S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 |
    TV.LV20.14 | TV.LV20.52

10. ANS: B   PTS: 1   DIF: L2   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.1 Finding the Area of a Regular Polygon   TOP: 10-5 Example 1
    KEY: area of a regular polygon | area | regular polygon | tangent | measure of central angle of a regular
    polygon
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16

11. ANS: C   PTS: 1   DIF: L2   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.1 Finding the Area of a Regular Polygon   TOP: 10-5 Example 1
    KEY: area of a regular polygon | area | regular polygon | tangent | measure of central angle of a regular
    polygon
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16

12. ANS: A   PTS: 1   DIF: L2   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.1 Finding the Area of a Regular Polygon   TOP: 10-5 Example 1
    KEY: area of a regular polygon | area | regular polygon | tangent | measure of central angle of a regular
    polygon
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16

13. ANS: A   PTS: 1   DIF: L2   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.2 Finding the Area of a Triangle   TOP: 10-5 Example 3
    KEY: area of a triangle | area | sine
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16

14. ANS: A   PTS: 1   DIF: L2   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.2 Finding the Area of a Triangle   TOP: 10-5 Example 3
    KEY: area of a triangle | area | sine
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16

15. ANS: A   PTS: 1   DIF: L2   REF: 10-6 Circles and Arcs
    OBJ: 10-6.1 Central Angles and Arcs   TOP: 10-6 Example 1
    KEY: central angle | circle graph | multi-part question | word problem | problem solving
    MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
    TV.LV20.13 | TV.LV20.14
16. ANS: C   PTS: 1   DIF: L2   REF: 10-6 Circles and Arcs
    OBJ: 10-6.2 Circumference and Arc Length   TOP: 10-6 Example 4
    KEY: circumference | diameter
    MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
    TV.LV20.13 | TV.LV20.14
17. ANS: C   PTS: 1   DIF: L2   REF: 10-6 Circles and Arcs
    OBJ: 10-6.2 Circumference and Arc Length   TOP: 10-6 Example 5
    KEY: arc | circumference
    MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
    TV.LV20.13 | TV.LV20.14
18. ANS: B   PTS: 1   DIF: L2   REF: 10-7 Areas of Circles and Sectors
    OBJ: 10-7.1 Finding Areas of Circles and Parts of Circles   TOP: 10-7 Example 1
    KEY: area of a circle | radius
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
19. ANS: A   PTS: 1   DIF: L2   REF: 10-7 Areas of Circles and Sectors
    OBJ: 10-7.1 Finding Areas of Circles and Parts of Circles   TOP: 10-7 Example 1
    KEY: area of a circle | radius
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
20. ANS: B   PTS: 1   DIF: L3   REF: 10-3 Areas of Regular Polygons
    OBJ: 10-3.1 Areas of Regular Polygons   TOP: 10-3 Example 1
    KEY: regular polygon | multi-part question
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.52
21. ANS: D   PTS: 1   DIF: L3   REF: 10-5 Trigonometry and Area
    OBJ: 10-5.2 Finding the Area of a Triangle   TOP: 10-5 Example 3
    KEY: area | area of a triangle | sine
    MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
    S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
    TV.LV20.16
22. ANS: D   PTS: 1   DIF: L3   REF: 10-6 Circles and Arcs
    OBJ: 10-6.2 Circumference and Arc Length   TOP: 10-6 Example 4
    KEY: circumference | radius
    MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
    TV.LV20.13 | TV.LV20.14

23. ANS: B   PTS: 1   DIF: L3   REF: 10-6 Circles and Arcs
    OBJ: 10-6.2 Circumference and Arc Length   TOP: 10-6 Example 4
    KEY: circumference | radius | diameter | area of a circle | word problem | problem solving
    MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
    TV.LV20.13 | TV.LV20.14

ESSAY

1. ANS:

   [4]   Answers may vary. Sample: If a basketball has a circumference of 30, then its
   diameter is $\dfrac{30}{\pi} \approx 9.549$. If the ball goes in exactly in the center of the rim, then
   there is a total of (18 – 9.549) inches or 8.551 inches on both sides of the ball.
   Therefore, there is half of this distance, or about 4.2 inches, between the ball and
   the rim.
   [3]   correct methods used, but with a computational error
   [2]   error in method
   [1]   correct answer with no work shown

   PTS: 1   DIF: L3   REF: 10-6 Circles and Arcs
   OBJ: 10-6.2 Circumference and Arc Length   TOP: 10-6 Example 4
   KEY: circumference | diameter | extended response | rubric-based question
   MSC: NAEP M1h | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.CP | S9.TSK2.GM | S10.TSK2.GM |
   TV.LV20.13 | TV.LV20.14

OTHER

1. ANS:
   Answers may vary. Sample: The apothem is one leg of a right triangle and the radius is the hypotenuse.
   A hypotenuse is always longer than either of the two legs.

   PTS: 1   DIF: L3   REF: 10-3 Areas of Regular Polygons
   OBJ: 10-3.1 Areas of Regular Polygons   TOP: 10-3 Example 1
   KEY: apothem | radius | regular polygon | reasoning
   MSC: NAEP M1h | CAT5.LV20.50 | CAT5.LV20.55 | CAT5.LV20.56 | IT.LV16.AM | IT.LV16.CP |
   S9.TSK2.GM | S9.TSK2.PRA | S10.TSK2.GM | S10.TSK2.PRA | TV.LV20.13 | TV.LV20.14 |
   TV.LV20.52