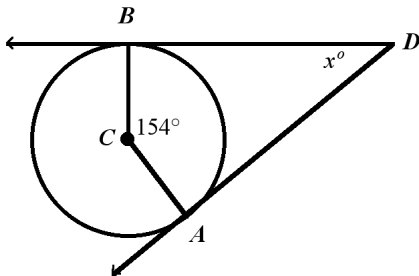## Geometry Semester 2 Final Review
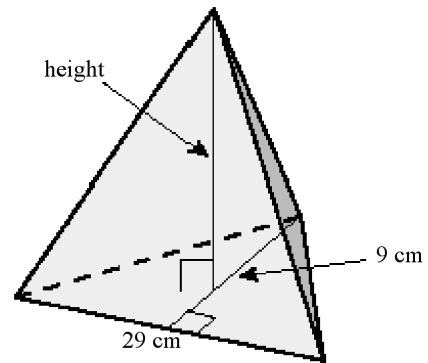
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1. Find the value of x.

5. A cone is inscribed in a cylinder with a radius of 6 units. Describe the relationship between the volume of the cylinder and the volume of the cone.

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6. Find the height of the triangular pyramid when the volume is 318 square centimeters. Round to the nearest hundredth.

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2. Write $\sin 33°$ in terms of cosine.

3. A rectangular yard is fenced in using 160 feet of custom fence. Your friends really like the fence and decide to fence in their yard using the same fence. Their yard is similar but has a scale factor of $\frac{3}{4}$ times the size of yours, how much fence, to the nearest foot, will they have to purchase?

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7. A custom fish tank shaped like a rectangular prism needs to have a length of 21 inches, a width of 23 inches and hold a volume of 7679 cubic inches. What height must the tank be made to meet these specifications?
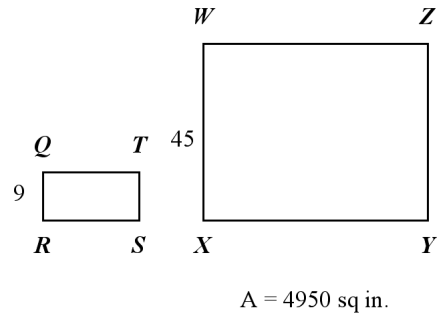
4. A carpenter is constructing a staircase in a house. The distance from the first floor to the basement is 8.6 feet. The staircase will be 14.1 feet long. What angle do the stairs make with the basement floor?
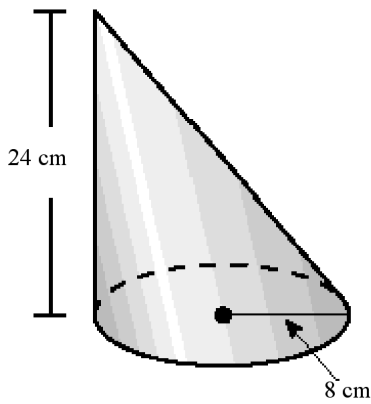
8. The diameter of ⊙Q is 14 centimeters. Find the arc length of $\overset{\frown}{PR}$.
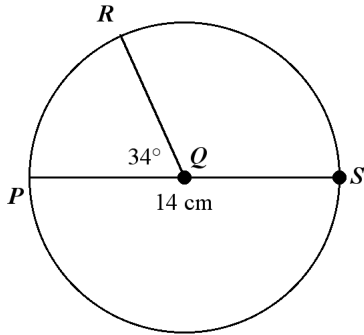
10. *QRST ~ WXYZ*. The area of *WXYZ* is given. Find the area of *QRST*.

A = 4950 sq in.

11. What is the length of $\overline{BG}$?

9. Find the volume of the cone. Leave your answer in terms of π.
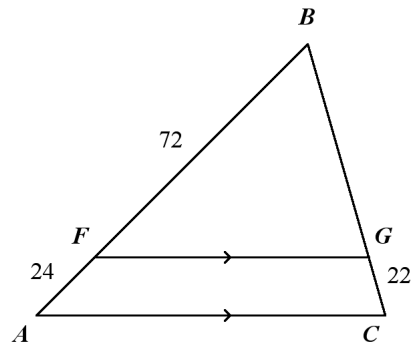
12. Find the angle "x" created by two secants.
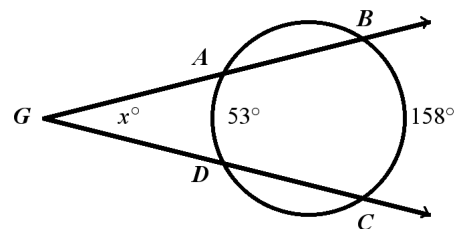
13. Find the area of each sector. Round your answers to the nearest hundredth.
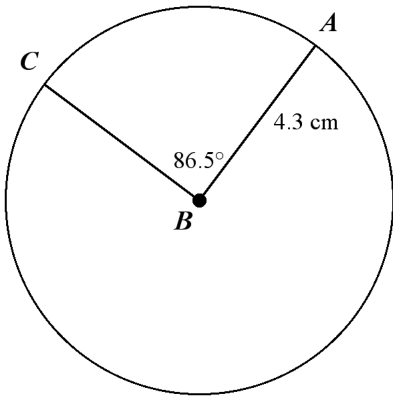
14. In the diagram, $KN = 4$, $JN = 20$, $LN = 10$, and $MN = x$. Find ML.
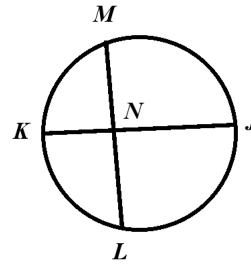
15. In the diagram, $m\angle J = 39.5°$. Find $m\overset{\frown}{JK}$.
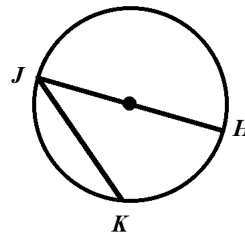
16. In the diagram, $m\angle QNS = 80°$, $m\angle SNU = 65°$, and $m\angle QNW = 95°$. Find the measure of each arc.

a. $\overset{\frown}{SW}$

b. $\overset{\frown}{QUW}$

c. $\overset{\frown}{UW}$

3

17. Find the measure of x.
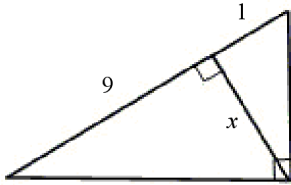
19. Determine whether the two triangles are similar. If they are similar, write a similarity statement and find the scale factor from triangle 2 to triangle 1.

20. Show that △BCD ~ △ABD.

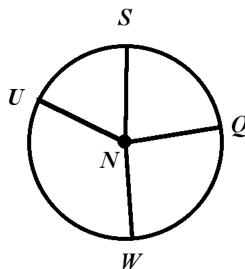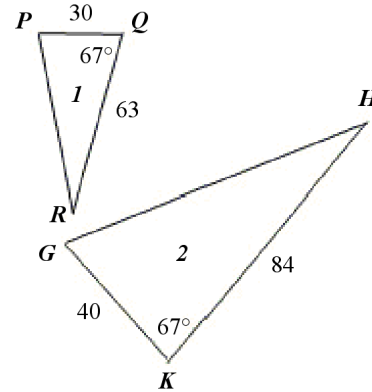18. An architect is designing a covered bridge to be placed over a ravine. In the diagram, $\overline{BF}$ and $\overline{BG}$ represent the sides of the ravine, $\overline{FG}$ represents the road surface of the bridge, and $\overline{AC}$ represents the roof covering the bridge. Would these measurements ensure the roof is parallel to the road surface of the bridge? Explain
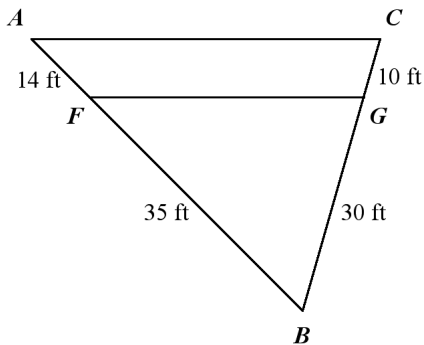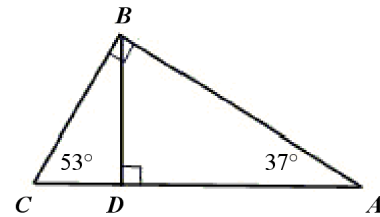
21. A parasailer is attached to a boat with a rope. While parasailing, the angle of depression to the boat is 25°. When the parasailer is attached to the boat with a 300-foot rope, how high above the boat is he? Round your answer to the nearest tenth of a foot.

22. Solve the triangle. Round decimal answers to the nearest tenth.

32 57° x

y
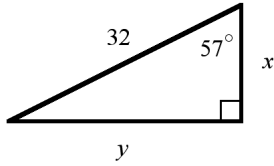
23. In the diagram, $BC = 9$. Find AB and AC. Write your answers in simplest form.

B
60°

C

30°

A
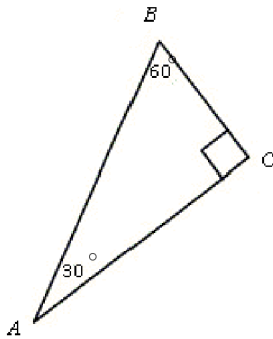
24. In the diagram, $AC = 12\sqrt{3}$. Find BC and AB. Write your answers in simplest form.

C

B 60°

30°

A
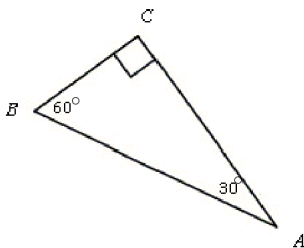
25. Find the value of x that makes the quadrilateral a parallelogram when $AE = 5x + 28$ and $CE = 3x + 36$.

D   A

E

C   B
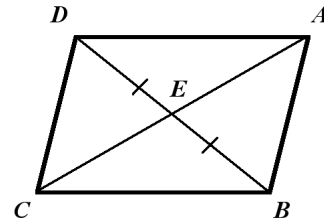
26. Find the area of the rhombus.

2 m
5 m

5 m

2 m
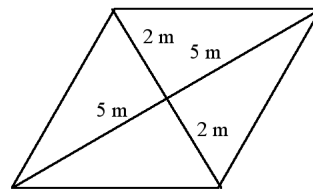
27. Find the area of the kite.

6 cm

11 cm   1 cm
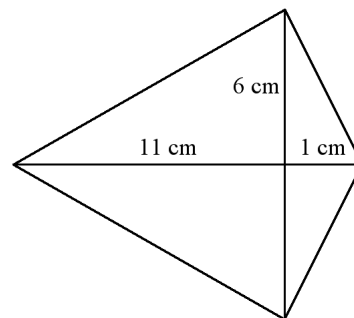
28. For what values of x and y is quadrilateral *ABCD* a parallelogram?

A

4y+20   8x–34

D   *B*

9x–40   6x–4

C
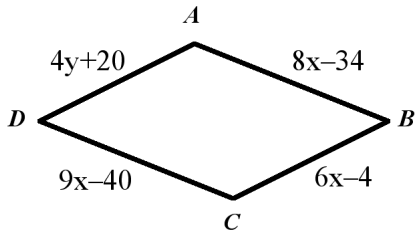
29. Find the value of x.

17

x

14
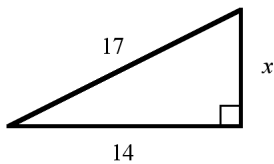
30. The end of a charger that is plugged into a phone is an isosceles trapezoid. Find $m\angle J$, $m\angle K$, and $m\angle M$ when $m\angle N = 140°$.

M   *N*

K   *J*
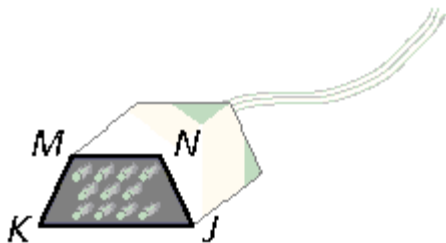
31. The badge shown is shaped like a regular nonagon. Find the measure of each interior angle of the badge. Then find the measure of each exterior angle.

32. In rectangle *ABCD*, $AC = -6x - 2$, $BP = -4x - 3$, and $DP = -6y - 19$. Find the value of y.

A   *B*

P

D   *C*
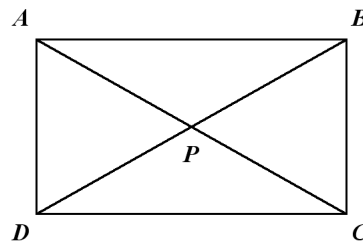
Geometry Semester 2 Final Review

Answer Section

1. ANS: 26

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 10.5
   NAT: HSG-C.A.2   KEY: circle | application | circumscribed angle
   NOT: Example 3-1
2. ANS:
   $\cos 57°$

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.5
   NAT: HSG-SRT.C.6 | HSG-SRT.C.7 | HSG-SRT.C.8   KEY: sine | cosine
   NOT: Example 2
3. ANS:
   120 feet

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 8.1
   NAT: HSG-SRT.A.2 | HSG-MG.A.3   KEY: similar figures | application | perimeter
   NOT: Example 4
4. ANS:
   about 37.6°

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.6
   NAT: HSG-SRT.C.8 | HSG-MG.A.1 | HSG-MG.A.3
   KEY: application | inverse trigonometric ratios   NOT: Example 5-1
5. ANS:
   The volume of the cone is 1/3 the volume of the cylinder.

   -or-

   The volume of the cylinder is 3 times the volume of the cone.

   PTS: 1   NAT: HSG-MD.A.1
6. ANS:
   about 7.31 cm

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.6
   NAT: HSG-GMD.A.1 | HSG-GMD.A.3 | HSG-MG.A.1   KEY: volume | pyramid
   NOT: Example 3
7. ANS:
   about 15.90 in.

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.5
   NAT: HSG-GMD.A.1 | HSG-GMD.A.2 | HSG-GMD.A.3 | HSG-MG.A.1 | HSG-MG.A.2
   KEY: volume | application   NOT: Example 4

8. ANS:
   about 4.15 cm

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.1
   NAT: HSG-C.B.5 | HSG-CO.A.1   KEY: arc length   NOT: Example 2
9. ANS:
   about 1608.5 cm^3
   512π cm^3

   PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.7
   NAT: HSG-GMD.A.1 | HSG-GMD.A.3   KEY: volume | cone
   NOT: Example 2
10. ANS:
    198 in.^{2}

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 8.1
    NAT: HSG-SRT.A.2   KEY: similar figures | area
    NOT: Example 5
11. ANS:
    66

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 8.4
    NAT: HSG-SRT.B.5 | HSG-GPE.B.6   KEY: Triangle Proportionality Theorem
    NOT: Example 1
12. ANS:
    $x = 52.5$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 10.5
    NAT: HSG-C.A.2   KEY: circle | application | measures of arcs
    NOT: Example 2
13. ANS:
    about 13.96 cm^2
    about 44.13 cm^2

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.2
    NAT: HSG-GMD.A.1 | HSG-C.B.5   KEY: area | sector of a circle
    NOT: Example 3
14. ANS:
    $ML = 18$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 10.6
    NAT: HSG-C.A.2   KEY: circle | segments of a chord | application
    NOT: Example 1

15. ANS:

$m\overset{\frown}{JK} = 101°$

PTS: 1   DIF: Level 1   REF: Geometry Sec. 10.4
NAT: HSG-C.A.2   KEY: inscribed angle   NOT: Example 1

16. ANS:

a. $m\overset{\frown}{SW} = 175°$

b. $m\overset{\frown}{QUW} = 265°$

c. $m\overset{\frown}{UW} = 120°$

PTS: 1   DIF: Level 1   REF: Geometry Sec. 10.2
NAT: HSG-C.A.2   KEY: circle | measures of arcs   NOT: Example 2

17. ANS:
$x = 3$

PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.3
NAT: HSG-SRT.B.5   KEY: geometric mean
NOT: Example 4

18. ANS:
$\dfrac{AF}{BF} = \dfrac{2}{5}$, $\dfrac{CG}{BG} = \dfrac{1}{3}$. Because $\dfrac{2}{5} \neq \dfrac{1}{3}$, the roof is not parallel to the road surface of the bridge.

PTS: 1   DIF: Level 2   REF: Geometry Sec. 8.4
NAT: HSG-SRT.B.5 | HSG-GPE.B.6   KEY: Triangle Proportionality Theorem | application
NOT: Example 2

19. ANS:

similar; $\triangle PQR \sim \triangle GKH$; scale factor = $\dfrac{3}{4}$

PTS: 1   DIF: Level 2   REF: Geometry Sec. 8.3
NAT: HSG-SRT.B.4 | HSG-SRT.B.5 | HSG-MG.A.1   KEY: SAS Similarity Theorem
NOT: Example 3

20. ANS:
$\angle BDC \cong \angle ADB$	Right Angles Congruence Theorem
$53° + 90° + m\angle CBD = 180°$, so $m\angle CBD = 37°$	Triangle Sum Theorem
$\angle CBD \cong \angle BAD$	definition of congruent angles
$\triangle BCD \sim \triangle ABD$	AA Similarity Theorem

PTS: 1   DIF: Level 1   REF: Geometry Sec. 8.2
NAT: HSG-SRT.A.3 | HSG-SRT.B.5   KEY: AA Similarity Theorem | similar figures
NOT: Example 2

21. ANS:
    about 126.8 ft

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.5
    NAT: HSG-SRT.C.6 | HSG-SRT.C.7 | HSG-SRT.C.8   KEY: sine | cosine | application
    NOT: Example 6-1
22. ANS:
    $x \approx 17.4, y \approx 26.8$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.5
    NAT: HSG-SRT.C.6 | HSG-SRT.C.7 | HSG-SRT.C.8   KEY: sine | cosine
    NOT: Example 3
23. ANS:
    $AB = 18, AC = 9\sqrt{3}$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.2
    NAT: HSG-SRT.C.8   KEY: special right triangles
    NOT: Example 2
24. ANS:
    $BC = 12, AB = 24$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.2
    NAT: HSG-SRT.C.8   KEY: special right triangles
    NOT: Example 2
25. ANS:
    $x = 4$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 7.3
    NAT: HSG-CO.C.11 | HSG-SRT.B.5 | HSG-MG.A.1   KEY: parallelogram
    NOT: Example 4
26. ANS:
    20 m^2

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.3
    NAT: HSG-GMD.A.3   KEY: area   NOT: Example 1
27. ANS:
    72 cm^2

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 11.3
    NAT: HSG-GMD.A.3   KEY: area   NOT: Example 1
28. ANS:
    $x = 6, y = 3$

    PTS: 1   DIF: Level 2   REF: Geometry Sec. 7.3
    NAT: HSG-CO.C.11 | HSG-MG.A.1   KEY: parallelogram
    NOT: Example 2-2

29. ANS:
    $x = \sqrt{93}$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 9.1
    NAT: HSG-SRT.C.8   KEY: Pythagorean Theorem
    NOT: Example 2
30. ANS:
    $m\angle M = 140°$, $m\angle K = 40°$, and $m\angle J = 40°$

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 7.5
    NAT: HSG-MG.A.1   KEY: trapezoid | isosceles trapezoid | application
    NOT: Example 2
31. ANS:
    interior: 140°; exterior: 40°

    PTS: 1   DIF: Level 1   REF: Geometry Sec. 7.1
    NAT: HSG-CO.C.11   KEY: angle measures of polygons | application
    NOT: Example 6
32. ANS:
    $y = -4$

    PTS: 1   DIF: Level 3   REF: Geometry Sec. 7.4
    NAT: HSG-CO.C.11 | HSG-SRT.B.5 | HSG-MG.A.1   KEY: rectangle
    NOT: Example 5