Geometry, 2nd Semester Exam (Review)

Find the length of the missing side. The triangle is not drawn to scale.

1. (1 point)

![Image of a triangle with sides 6, 8, and missing side.

Options: a. 28 b. 100 c. 10 d. 48

Find the length of the missing side. Leave your answer in simplest radical form.

2. (1 point)

![Image of a triangle with sides 18 m and 11 m.

Options: a. \(\sqrt{29}\) m b. \(\sqrt{445}\) m c. \(\sqrt{7}\) m d. \(\sqrt{203}\) m

3. (1 point)

A triangle has sides of lengths 6, 8, and 10. Is it a right triangle? Explain.

Options: a. yes; \(6^2 + 8^2 \neq 10^2\) b. no; \(6^2 + 8^2 = 10^2\)

4. (1 point)

A triangle has side lengths of 14 cm, 48 cm, and 50 cm. Classify it as acute, obtuse, or right.

Options: a. right b. acute c. obtuse

5. (1 point)

A triangle has side lengths of 28 in, 4 in, and 31 in. Classify it as acute, obtuse, or right.

Options: a. obtuse b. right c. acute
6. (1 point)
Write the tangent ratios for \( \angle P \) and \( \angle Q \).

\[
\begin{align*}
P & \quad 29 \quad 21 \quad Q \\
R & \quad 20 \quad 21 \quad Q
\end{align*}
\]

Not drawn to scale

\begin{align*}
a. \quad \tan P &= \frac{29}{21}, \quad \tan Q = \frac{21}{29} & \quad c. \quad \tan P &= \frac{21}{20}, \quad \tan Q = \frac{20}{21} \\
b. \quad \tan P &= \frac{20}{21}, \quad \tan Q = \frac{21}{20} & \quad d. \quad \tan P &= \frac{29}{20}, \quad \tan Q = \frac{20}{29}
\end{align*}

Use a trigonometric ratio to find the value of \( x \). Round your answer to the nearest tenth.

7. (1 point)

\[
\begin{align*}
x & \quad 20^\circ \\
9 & \quad 9
\end{align*}
\]

Not drawn to scale

\begin{align*}
a. \quad 3.3 & \quad b. \quad 3.1 & \quad c. \quad 24.7 & \quad d. \quad 8.5
\end{align*}

Find the value of \( x \). Round to the nearest tenth.

8. (1 point)

\[
\begin{align*}
x & \quad 28^\circ \\
11 & \quad 11
\end{align*}
\]

Not drawn to scale

\begin{align*}
a. \quad 12.5 & \quad b. \quad 10 & \quad c. \quad 13 & \quad d. \quad 9.7
\end{align*}
9. (1 point)

\[ \begin{array}{c}
\text{18} \\
\text{35°} \\
\text{x}
\end{array} \]

Not drawn to scale

a. 10.3  

b. 31.4  

c. 10.7  

d. 31.8

10. (1 point)
A large totem pole in the state of Washington is 100 feet tall. At a particular time of day, the totem pole casts a 249-foot-long shadow. Find the measure of \( \angle A \) to the nearest degree.

\[ \begin{array}{c}
\text{A} \\
249 \text{ ft} \\
100 \text{ ft}
\end{array} \]

a. 68°  

b. 45°  

c. 35°  

d. 22°

Find the value of \( x \). Round to the nearest degree.

11. (1 point)

\[ \begin{array}{c}
\text{21} \\
\text{x°} \\
\text{15}
\end{array} \]

Not drawn to scale

a. 41  

b. 36  

c. 46  

d. 44

Find the value of \( x \) to the nearest degree.

12. (1 point)

\[ \begin{array}{c}
\sqrt{58} \\
\text{x°} \\
3
\end{array} \]

a. 67  

b. 23  

c. 83  

d. 53
Find the value of $x$. Round the length to the nearest tenth.

13. (1 point)

\[
\begin{array}{c}
\text{Not drawn to scale} \\
18 \text{ yd} \\
30^\circ \\
x
\end{array}
\]

a. 15.6 yd  
   b. 10.4 yd  
   c. 9 yd  
   d. 31.2 yd

14. (1 point)

To approach the runway, a pilot of a small plane must begin a $9^\circ$ descent starting from a height of 1125 feet above the ground. To the nearest tenth of a mile, how many miles from the runway is the airplane at the start of this approach?

\[
\begin{array}{c}
\text{Not drawn to scale} \\
1125 \text{ ft} \\
9^\circ \\
x
\end{array}
\]

a. 1.3 mi  
   b. 1.4 mi  
   c. 0.2 mi  
   d. 7,191.5 mi

15. (1 point)

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

\[
\begin{array}{c}
\text{Not drawn to scale} \\
29 \text{ in.} \\
48 \text{ in.} \\
42 \text{ in.}
\end{array}
\]

a. 1392 in.$^2$  
   b. 142 in.$^2$  
   c. 71 in.$^2$  
   d. 1218 in.$^2$
16. (1 point)

[Diagram of a triangle with sides 17 cm and 7 cm]

a. 12 cm²  
   b. 59.5 cm²  
   c. 24 cm²  
   d. 119 cm²

17. (1 point)

[Diagram of a trapezoid with bases 4.9 cm and 4.8 cm]

a. 9.7 cm²  
   b. 23.52 cm²  
   c. 0.1 cm²  
   d. 47.04 cm²

18. (1 point)

[Diagram of a trapezoid with bases 12.6 in. and 14.5 in., and height 29.2 in.]

a. 77.2 in.²  
   b. 303.66 in.²  
   c. 607.32 in.²  
   d. 36.7 in.²

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

19. (1 point)

Find the area of the rhombus.

[Diagram of a rhombus with sides 6 m]

a. 9 m²  
   b. 1296 m²  
   c. 18 m²  
   d. 72 m²
20. (1 point)

\[ \begin{align*}
&8 \text{ cm} \\
&7 \text{ cm} \\
&45^\circ \\
&3 \text{ cm}
\end{align*} \]
Not drawn to scale

a. 98 cm\(^2\)  

b. 91 cm\(^2\)  

c. 38.5 cm\(^2\)  

d. 11 cm\(^2\)

21. (1 point)

Find the area of the regular polygon. Round your answer to the nearest tenth.

\[ \begin{align*}
&10 \text{ in.} \\
&13.07 \text{ in.}
\end{align*} \]

a. 483.0 in\(^2\)  

b. 80.0 in\(^2\)  

c. 176.6 in\(^2\)  

d. 966.1 in\(^2\)

22. (1 point)

Given the regular polygon, find the measure of each numbered angle.

\[ \begin{align*}
&m\angle 1 = 45, m\angle 2 = 135 \\
&m\angle 1 = m\angle 2 = 60 \\
&m\angle 1 = 45, m\angle 2 = 67.5 \\
&m\angle 1 = 22.5, m\angle 2 = 78.75
\end{align*} \]

23. (1 point)

A gardener needs to cultivate a triangular plot of land. One angle of the garden is 47\(^\circ\), and two sides adjacent to the angle are 77 feet and 76 feet. To the nearest tenth, what is the area of the plot of land?

a. 4279.9 ft\(^2\)  

b. 2163.5 ft\(^2\)  

c. 2139.9 ft\(^2\)  

d. 1995.5 ft\(^2\)
24. (1 point)
Divers looking for a sunken ship have defined the search area as a triangle with adjacent sides of length 2.75 miles and 1.32 miles. The angle between the sides of the triangle is 35°. To the nearest hundredth, find the search area.

a. 1.49 mi²  
   b. 2.97 mi²  
   c. 1.04 mi²  
   d. 2.08 mi²

25. (1 point)
Find the area of the regular polygon. Give the answer to the nearest tenth.

pentagon with side 7 cm

a. 67.4 cm²  
   b. 84.3 cm²  
   c. 168.6 cm²  
   d. 16.9 cm²

26. (1 point)
decagon with side of 4 cm

a. 123.1 cm²  
   b. 129.4 cm²  
   c. 246.2 cm²  
   d. 139.8 cm²

27. (1 point)
pentagon with a radius of 8 m

a. 304.3 m²  
   b. 152.2 m²  
   c. 30.4 m²  
   d. 154.2 m²

28. (1 point)

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

a. 92.3 cm²  
   b. 40.4 cm²  
   c. 19.7 cm²  
   d. 80.9 cm²

29. (1 point)

Find the area of the triangle. Give the answer to the nearest tenth. The drawing may not be to scale.
30. (1 point)
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**

- Watching TV: 13%
- Socializing: 13%
- Homework: 8%
- Eating: 8%
- School: 23%
- Sleeping: 33%

30. (1 point)

Find the circumference. Leave your answer in terms of $\pi$.

31. (1 point)

![Diagram of a circle with a diameter of 4.1 cm]

- a. $6.15\pi$ cm
- b. $8.2\pi$ cm
- c. $2.05\pi$ cm
- d. $4.1\pi$ cm

32. (1 point)

Find the length of arc $XPY$. Leave your answer in terms of $\pi$.

- a. $5\pi$ m
- b. $15\pi$ m
- c. $900\pi$ m
- d. $30\pi$ m
33. (1 point)
Find the area of the figure to the nearest tenth.

![Diagram of a sector of a circle with a central angle of 130° and a radius of 5 inches.]

a. 56.7 in.\(^2\)  
   b. 5.7 in.\(^2\)  
   c. 28.3 in.\(^2\)  
   d. 9 in.\(^2\)

Find the area of the circle. Leave your answer in terms of \(\pi\).

34. (1 point)

![Diagram of a circle with a diameter of 6.6 meters.]

a. 43.56\(\pi\) m\(^2\)  
   b. 16.2\(\pi\) m\(^2\)  
   c. 21.78\(\pi\) m\(^2\)  
   d. 10.89\(\pi\) m\(^2\)

35. (1 point)
A jewelry store buys small boxes in which to wrap items that they sell. The diagram below shows one of the boxes. Find the lateral area and the surface area of the box to the nearest whole number.

![Diagram of a rectangular prism with dimensions 15 cm, 8 cm, and 2.95 cm.]

Not drawn to scale

a. 164 cm\(^2\); 376 cm\(^2\)  
   b. 164 cm; 256 cm  
   c. 329 cm\(^2\); 376 cm\(^2\)  
   d. 329 cm; 256 cm
Use formulas to find the lateral area and surface area of the given prism. Show your answer to the nearest whole number.

36. (1 point)

![Prism Diagram]

Not drawn to scale

a. $494 \text{ m}^2; 522 \text{ m}^2$

b. $468 \text{ m}; 550 \text{ m}$

c. $494 \text{ m}^2; 508 \text{ m}^2$

d. $468 \text{ m}; 522 \text{ m}$

Find the surface area of the cylinder in terms of $\pi$.

37. (1 point)

![Cylinder Diagram]

Not drawn to scale

a. $238\pi \text{ in.}^2$

b. $210\pi \text{ in.}^2$

c. $308\pi \text{ in.}^2$

d. $602 \text{ in.}^2$

38. (1 point)

![Cylinder Diagram]

Not drawn to scale

a. $400\pi \text{ cm}^2$

b. $672 \text{ cm}^2$

c. $1056\pi \text{ cm}^2$

d. $784\pi \text{ cm}^2$
39. (1 point)
Find the lateral area of the pyramid shown to the nearest whole number.

![Pyramid Diagram]

Not drawn to scale

a. $2509 \text{ yd}^2$  
   b. $3753 \text{ yd}^2$  
   c. $1612 \text{ yd}^2$  
   d. $1877 \text{ yd}^2$

40. (1 point)
Find the surface area of the cone in terms of $\pi$.

![Cone Diagram]

Not drawn to scale

a. $276\pi \text{ cm}^2$  
   b. $132\pi \text{ cm}^2$  
   c. $156\pi \text{ cm}^2$  
   d. $138 \text{ cm}^2$

41. (1 point)
Find the surface area of the figure to the nearest whole number.

![Figure Diagram]

a. $74 \text{ ft}^2$  
   b. $310 \text{ ft}^2$  
   c. $135 \text{ ft}^2$  
   d. $155 \text{ ft}^2$
Find the surface area of the pyramid shown to the nearest whole number.

42. (1 point)

\[
\begin{align*}
\text{Not drawn to scale} \\
a. & \quad 33^2 \quad \text{ft} \\
b. & \quad 205^2 \quad \text{ft} \\
c. & \quad 90^2 \quad \text{ft} \\
d. & \quad 115^2 \quad \text{ft}
\end{align*}
\]

43. (1 point)
Find the slant height \(x\) of the pyramid shown to the nearest tenth.

\[
\begin{align*}
\text{Not drawn to scale} \\
a. & \quad 4.9 \text{ mm} \\
b. & \quad 4.8 \text{ mm} \\
c. & \quad 7.4 \text{ mm} \\
d. & \quad 8.6 \text{ mm}
\end{align*}
\]
Find the volume of the given prism. Round to the nearest tenth if necessary.

44. (1 point)

\[
\text{Not drawn to scale}
\]

a. \(308.9 \text{ cm}^3\)  
b. \(308.2 \text{ cm}^3\)  
c. \(312.8 \text{ cm}^3\)  
d. \(302.9 \text{ cm}^3\)

45. (1 point)

\[
\text{Not drawn to scale}
\]

a. \(2046.0 \text{ yd}^3\)  
b. \(4092.0 \text{ yd}^3\)  
c. \(2362.5 \text{ yd}^3\)  
d. \(1670.5 \text{ yd}^3\)

Find the volume of the cylinder in terms of \(\pi\).

46. (1 point)

\[
\text{Not drawn to scale}
\]

a. \(60.8 \text{ m}^3\)  
b. \(115.52\pi \text{ m}^3\)  
c. \(438.98\pi \text{ m}^3\)  
d. \(57.76\pi \text{ m}^3\)
Find the volume of the square pyramid shown. Round to the nearest tenth if necessary.

47. (1 point)

Find the volume of the cone shown as a decimal rounded to the nearest tenth.

48. (1 point)

Find the volume of the oblique cone shown. Round to the nearest tenth.

49. (1 point)
50. A balloon has a circumference of 23 cm. Use the circumference to approximate the surface area of the balloon to the nearest square centimeter.
   a. 1662 cm²   b. 168 cm²   c. 529 cm²   d. 674 cm²

Find the volume of the sphere shown. Give each answer rounded to the nearest cubic unit.

51. 
   ![Sphere Diagram](image)
   a. 268 mm³   b. 1072 mm³   c. 804 mm³   d. 2145 mm³

Find the surface area of the sphere with the given dimension. Leave your answer in terms of \( \pi \).

52. (1 point)
   diameter of 14 cm
   a. \( 784\pi \) cm²   b. \( 28\pi \) cm²   c. \( 98\pi \) cm²   d. \( 196\pi \) cm²

53. (1 point)
   Find the center and radius of the circle with equation \((x - 5)^2 + (y + 3)^2 = 25\).
   a. center (5, -3); \( r = 25 \)   c. center (5, -3); \( r = 5 \)
   b. center (-5, 3); \( r = 25 \)   d. center (3, -5); \( r = 5 \)

54. (1 point)
   Write the standard equation of the circle in the graph.
   ![Circle Graph](image)
   a. \((x + 3)^2 + (y - 2)^2 = 18\)   c. \((x - 3)^2 + (y + 2)^2 = 18\)
   b. \((x - 3) + (y + 2) = 9\)   d. \((x + 3) + (y - 2) = 9\)
55. (1 point)
A low-wattage radio station can be heard only within a certain distance from the station. On the graph below, the circular region represents that part of the city where the station can be heard, and the center of the circle represents the location of the station. Which equation represents the boundary for the region where the station can be heard?

\[
\begin{align*}
\text{a. } & (x + 6)^2 + (y + 1)^2 = 32 \\
\text{b. } & (x - 6)^2 + (y - 1)^2 = 32 \\
\text{c. } & (x + 6)^2 + (y + 1)^2 = 16 \\
\text{d. } & (x - 6)^2 + (y - 1)^2 = 16
\end{align*}
\]

Use the Law of Sines to find the missing side of the triangle.

56. (1 point)
Find \(b\).

\[
\begin{align*}
\text{a. } & 70.1 \\
\text{b. } & 43.8 \\
\text{c. } & 57.1 \\
\text{d. } & 31.5
\end{align*}
\]
57. (1 point)
Use the Law of Cosines. Find $b$ to the nearest tenth.

\[
\begin{align*}
\triangle ABC \quad &
\begin{array}{c}
\measuredangle B = 48^\circ \\
b & \\
\end{array}
\end{align*}
\]

Possible answers:
- a. 102.2
- b. 62.4
- c. 132.9
- d. 63.2

Assume that lines that appear to be tangent are tangent. $O$ is the center of the circle. Find the value of $x$.
(Figures are not drawn to scale.)

58. (1 point)
$m\angle O = 111$

\[
\begin{align*}
\angle O &
\begin{array}{c}
x \degree \\
O
\end{array}
\end{align*}
\]

Possible answers:
- a. 291
- b. 69
- c. 55.5
- d. 222

59. (1 point)
$AB$ is tangent to $O$. If $AO = 24$ and $BC = 50$, what is $AB$?
The diagram is not to scale.

\[
\begin{align*}
\triangle ABC \quad &
\begin{array}{c}
\measuredangle B \\
A
\end{array}
\end{align*}
\]

Possible answers:
- a. 74
- b. 94
- c. 70
- d. 100
60. (1 point)
\( \overline{AB} \) is tangent to circle \( O \) at \( B \). Find the length of the radius \( r \) for \( AB = 5 \) and \( AO = 8.6 \). Round to the nearest tenth if necessary. The diagram is not to scale.

\[ \text{Diagram of a circle with tangent line at point B.} \]

\[ a. \ 9.9 \quad b. \ 7 \quad c. \ 13 \quad d. \ 3.6 \]

61. (1 point)
The circles are congruent. What can you conclude from the diagram?

\[ \text{Diagram of two circles with points labeled C, O, A, B, P, F, D, E.} \]

\[ a. \ \overline{CAB} \cong \overline{FDE} \quad b. \ \overline{DF} \cong \overline{AC} \quad c. \ \overline{AB} \cong \overline{DE} \quad d. \ \text{none of these} \]

62. (1 point)
\( \overline{NA} \cong \overline{PA}, \overline{MO} \perp \overline{NA}, \overline{RO} \perp \overline{PA}, MO = 3 \text{ ft} \)

What is \( PO \)?

\[ \text{Diagram of a circle with points labeled R, P, A, O, N, M.} \]

\[ a. \ 1.5 \text{ ft} \quad b. \ 6 \text{ ft} \quad c. \ 9 \text{ ft} \quad d. \ 3 \text{ ft} \]
Find the value of \( x \). If necessary, round your answer to the nearest tenth. The figure is not drawn to scale.

63. (1 point)

\[
\begin{array}{c}
\text{63.} \\
\hline
\begin{array}{c}
\text{6} \\
\text{8} \\
\text{x} \\
\end{array}
\end{array}
\]

a. 8  b. 5  c. 6  d. 10

64. (1 point)

\[
\begin{array}{c}
\text{64.} \\
\hline
\begin{array}{c}
\text{23} \\
\text{7} \\
\text{x} \\
\end{array}
\end{array}
\]

a. 21.9  b. 181.3  c. 24  d. 13.5

65. (1 point)

Find the measure of \( \angle BAC \). (The figure is not drawn to scale.)

\[
\begin{array}{c}
\text{65.} \\
\hline
\begin{array}{c}
\text{A} \\
\text{O} \\
\text{B} \\
\text{C} \\
\end{array}
\end{array}
\]

a. 57  b. 28.5  c. 33  d. 114
66. (1 point)
Find \(x\). (The figure is not drawn to scale.)

\[A \quad x \quad O \quad B \quad 46\]

a. 92    b. 44    c. 23    d. 46
Geometry, 2nd Semester Exam (Review)
Answer Section

1. C
2. D
3. D
4. A
5. A
6. B
7. C
8. A
9. B
10. D
11. D
12. B
13. B
14. B
15. D
16. B
17. B
18. B
19. D
20. B
21. A
22. C
23. C
24. C
25. B
26. A
27. B
28. B
29. A
30. A
31. D
32. B
33. C
34. D
35. C
36. A
37. C
38. A
39. D
40. C
41. D
42. D
43. C
44. A
45. A
46. B
47. C
48. B
49. B
50. B
51. D
52. D
53. C
54. B
55. C
56. B
57. D
58. B
59. C
60. B
61. C
62. A
63. D
64. D
65. B
66. C