

TEST A**CHAPTER 8, GEOMETRY**

- _____1. A rectangular plot of ground is to be enclosed with 180 yd of fencing. If the plot is twice as long as it is wide, what are its dimensions?
- _____2. A 4 cm by 6 cm rectangle has all four of its vertices on a circle. Find the circumference of the circle. (Leave your answer in terms of π .)
- _____3. In Problem 3, find the area of the region that is inside the circle and outside the rectangle. (Leave your answer in terms of π .)
- _____4. A circular cylinder has a circumference of 33 in. Use $\frac{22}{7}$ as the approximate value of π and find the radius of this cylinder.
- _____5. The width of a rectangle is 10 feet and its diagonal is 26 ft long. Find the length of this rectangle.
- _____6. A window is in the shape of a rectangle surmounted by a semicircle. The width of the window is 6 ft, which is also the diameter of the circle, and the height of the rectangular part is 5 ft. Find the total area of this window.
- _____7. A circle of diameter 6 in. has its center at the center of a square of side 6 in. Find the area of the region that is inside the square and outside the circle.
- _____8. The dimensions of a rectangular box are 2 ft by 4 ft by 5 ft. Find the total surface area of this box.
- _____9. A solid consists of a cone and a hemisphere mounted base to base. If the radius of the common base is 2 in. and the volume of the cone is equal to the volume of the hemisphere, what is the height of the cone?

- _____ 10. A sphere and a circular cylinder have the same radius, 8 cm. If the two solids have equal total surface areas, what is the height of the cylinder?
- _____ 11. The base of a pyramid is a triangle whose base is 6 ft and whose height is 3 ft. If the pyramid is of height 5 ft, what is the volume of this pyramid?
- _____ 12. Which of the following statements is incorrect?
1. A network with three odd vertices is not traversable.
 2. A network with exactly two odd vertices is traversable.
 3. A network with four odd vertices is traversable.
 4. A network with four even and no odd vertices is traversable.
- _____ 13. You have two buttons, one with two holes and the other with four holes. Are these buttons topologically equivalent? Why?
- _____ 14. State the genus of each of the buttons in Problem 13.
- _____ 15. In the equation $y = 2x(1-x)$, take $x = 0.3$ and find y_1 . Then let $x = y_1$ and find y_2 . After one more step what is the value of y correct to 3 decimal places?
- _____ 16. Start with a square that is one inch on a side and replace a portion of each of these sides by adding on a square with sides parallel to and with two of the sides equidistant from the sides of the original square and $1/4$ of an inch high. What is the total area of the resulting figure?
- _____ 17. X, Y, and Z are three points, in order from left to right on a line AB. What does $\overleftrightarrow{XZ} \cap \overleftrightarrow{YX}$ describe?

- _____ 18. The edges of the two bases of a rectangular prism form how many pairs of parallel lines?
- _____ 19. Through how many degrees does the hour hand of a clock turn in going from 1 o'clock to 6 o'clock?
- _____ 20. If $\angle A$ and $\angle B$ are supplementary and $m\angle A = 3m\angle B$, find the measure of $\angle A$.
- _____ 21. In a triangle ABC, $m\angle A = 38^\circ$ and $m\angle B = 48^\circ$. Find $m\angle C$.
- _____ 22. In a triangle ABC, $m\angle C = 4m\angle A = 4m\angle B$. Find $m\angle C$.
- _____ 23. In the word **SUNSHADE**, which letters are simple but not closed broken lines?
- _____ 24. Triangles ABC and XYZ are similar, with $m\angle A = m\angle X$ and $m\angle B = m\angle Y$. If AB, BC, and AC are 2 in., 3 in., and 4 in. long, respectively, and XY is 3 in. long, find the length of YZ.
- _____ 25. What is the measure of one of the interior angles of a regular polygon of nine sides?

TEST B**CHAPTER 8, GEOMETRY**

1. A rectangular plot of ground is to be enclosed with 180 yd of fencing. If the plot is twice as long as it is wide, what are its dimensions?
 - a. 30 by 60 yd
 - b. 20 by 40 yd
 - c. 35 by 70 yd
 - d. 25 by 50 yd
 - e. None of these

2. A 4 cm by 6 cm rectangle has all four of its vertices on a circle. Find the circumference of the circle. (Leave your answer in terms of π .)
 - a. 7π cm
 - b. $6\sqrt{2}\pi$ cm
 - c. 8π cm
 - d. $2\sqrt{13}\pi$ cm
 - e. None of these

3. In Problem 2, find the area of the region that is inside the circle and outside the rectangle. (Leave your answer in terms of π .)
 - a. $(9\pi - 24)$ cm²
 - b. $(10\pi - 24)$ cm²
 - c. $(13\pi - 24)$ cm²
 - d. $(7\pi - 24)$ cm²
 - e. None of these

4. A circular cylinder has a circumference of 33 in. Use $\frac{22}{7}$ as the approximate value of π and find the radius of this cylinder.
 - a. 10 in.
 - b. 14 in.
 - c. $5\frac{1}{4}$ in.
 - d. 9 in.
 - e. None of these

5. The width of a rectangle is 10 feet and the diagonal is 26 feet long. Find the length of the rectangle.
 - a. 28 ft
 - b. 24 ft
 - c. 30 ft
 - d. 32 ft
 - e. None of these

6. A window is in the shape of a rectangle surmounted by a semi-circle. The width of the window is 6 ft, which is also the diameter of the circle, and the height of the rectangular part is 5 ft. Find the total area of this window.
 - a. $(30 + 9\pi)$ ft²
 - b. $(30 + 6\pi)$ ft²
 - c. $(30 + 4.5\pi)$ ft²
 - d. $(30 + 4\pi)$ ft²
 - e. None of these

7. A circle of diameter 6 in. has its center at the center of a square of side 6 in. Find the area of the region that is inside the square and outside the circle.
 - a. $(36\pi - 36)$ in.²
 - b. $(36 - 6\pi)$ in.²
 - c. $(36 - 9\pi)$ in.²
 - d. $(9\pi - 36)$ in.²
 - e. None of these

8. The dimensions of a rectangular box are 2 ft by 4 ft by 5 ft. The total surface area of this box is
- a. 38 ft^2 b. 40 ft^2 c. 60 ft^2
d. 76 ft^2 e. None of these
9. A solid consists of a cone and a hemisphere mounted base to base. If the radius of the common base is 2 in. and the volume of the cone is equal to the volume of the hemisphere, what is the height of the cone?
- a. 2 in. b. 4 in. c. 6 in.
d. 8 in. e. 10 in.
10. A sphere and a circular cylinder have the same radius, 8 cm. If the two solids have equal total surface areas, what is the height of the cylinder?
- a. 2 cm b. 4 cm c. 6 cm
d. 8 cm e. None of these
11. The base of a pyramid is a triangle whose base is 6 ft and whose height is 3 ft. If the pyramid is 5 ft high, what is its volume?
- a. 10 ft^3 b. 15 ft^3 c. 20 ft^3
d. 25 ft^3 e. 30 ft^3
12. Which of the following statements is incorrect?
1. A network with three odd vertices is not traversable.
 2. A network with two odd vertices is traversable.
 3. A network with a four odd vertices is traversable.
 4. A network with four even and no odd vertices is traversable.
- a. 1 b. 2 c. 3
d. 4 e. None of these
13. Two buttons with an even number of holes
1. are always topologically equivalent.
 2. are never topologically equivalent.
 3. could be topologically equivalent.
 4. are always of the same genus.
 5. could be of the same genus.
- Which two of these are correct?
- a. 1 and 4 b. 2 and 5 c. 3 and 4
d. 3 and 5 e. 2 and 4

14. If a button has an even number of holes, then its genus is always
 a. 2 b. 4 c. equal to the number of holes
 d. 1 e. None of these
15. In the equation $y = 2x(1 - x)$, take $x = 0.4$ and find y_1 . Then let $x = y_1$ and find y_2 . Next let $x = y_2$ and find y_3 . To three decimal places, $y_3 =$
 a. 0.420 b. 0.480 c. 0.490 d. 0.500 e. None of these
16. Start with a square that is one inch on a side and replace the middle quarter of each side by adding on a square whose sides are parallel to the sides of the original square. How many square inches is the total area of the resulting figure?
 a. $1\frac{1}{2}$ b. 2 c. $1\frac{3}{4}$ d. $1\frac{1}{4}$ e. None of these
17. X, Y, and Z are three points, in order from left to right on a line AB. What does $\overleftrightarrow{XZ} \cap \overleftrightarrow{YZ}$ describe?
 a. Point Y b. \overleftrightarrow{XY} c. \overleftrightarrow{YZ}
 d. \overleftrightarrow{XZ} e. None of these
18. The edges of the two bases of a rectangular prism form how many pairs of parallel lines?
 a. 4 b. 8 c. 19
 d. 12 e. None of these
19. Through how many degrees does the hour hand of a clock turn in going from 1 o'clock to 6 o'clock?
 a. 100 b. 120 c. 150
 d. 110 e. None of these
20. If $\angle A$ and $\angle B$ are supplementary and $m\angle A = 3m\angle B$, find the measure of $\angle A$.
 a. 120° b. 135° c. 150°
 d. 160° e. None of these

21. In a triangle ABC, $m\angle A = 38^\circ$ and $m\angle B = 48^\circ$. Find $m\angle C$.
- a. 90° b. 92° c. 94°
d. 66° e. 96°
22. In a triangle ABC, $m\angle C = 4m\angle A = 4m\angle B$. Find $m\angle C$.
- a. 80° b. 00° c. 160°
d. 100° e. 120°
23. In the word SUNSHADE, which letters are simple but not closed broken lines?
- a. N, H, A and E b. N and A c. N and E
d. H and E e. Only N
24. Triangles ABC and XYZ are similar, with $m\angle A = m\angle X$ and $m\angle B = m\angle Y$. If AB, BC, and AC are 2 in., 3 in., and 4 in. long, respectively, and XY is 3 in. long, find the length of YZ.
- a. 5 in. b. 6 in. c. 6.5 in.
d. 4.5 in. e. None of these
25. The measure of one of the interior angles of a regular polygon of nine sides is
- a. 100° b. 110° c. 120°
d. 140° e. 150°