GEOMETRY TEST 4

Name_____ Date_____

Directions: Complete as many problems as you can in the 30 minutes allotted to you. No calculators! Figures are not drawn to scale. Do not assume any pair of line segments are congruent, parallel, or perpendicular unless specifically stated. You may assume all lines that appear straight are straight. Use 3.14 for π when necessary.

1. Find the volume of a right rectangular solid if the width is twice the length and the height is twice the width. The length is 2 inches.

(**A**) $32\,in^3$ (**B**) $48\,in^3$ (**C**) $56\,in^3$ (**D**) $64\,in^3$ (**E**) $112\,in^3$

2. When constructing an inscribed circle within a triangle, _____ need to be constructed.

(**A**) 2 altitudes (**B**) 2 $\angle$ bisectors (**C**) 2 medians (**D**) 2 $\perp$ bisectors (**E**) 2 diameters

3. If a leg of an isosceles right triangle is 8, find the length of the other leg.

(**A**) 8 (**B**) $8\sqrt{2}$ (**C**) $8\sqrt{3}$ (**D**) $\frac{8}{\sqrt{2}}$ (**E**) $\frac{8}{\sqrt{3}}$

4. Given $\frac{x}{w}=\frac{y}{z}$, which of the following does not have to be true? Assume all variables represent positive integers.

(**A**) $\frac{x}{y}=\frac{w}{z}$ (**B**) $\frac{w}{x}=\frac{z}{y}$ (**C**) $\frac{x+y}{y}=\frac{w+z}{z}$ (**D**) $\frac{y}{x}=\frac{z}{w}$ (**E**) $\frac{x}{z}=\frac{w}{y}$

5. How many more sides does a decagon have than a heptagon?

(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 5

6. What is the interior angle sum of a 1002 sided convex polygon ?

(**A**) 360° (**B**) $180,000^\circ$ (**C**) $180,360^\circ$ (**D**) $360,000$ (**E**) $360,360$

7. What does the ratio of 7 hours, 59 minutes, 60 seconds to 1 week simplify to?

(**A**) $\frac{1}{21}$ (**B**) $\frac{2}{21}$ (**C**) $\frac{1}{3}$ (**D**) $\frac{1}{10}$ (**E**) $\frac{1}{24}$

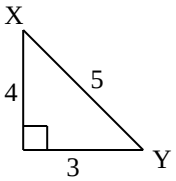
8. The shortest leg of a 30-60-90 triangle is 6. Which of the following would be equivalent to the length of the hypotenuse?

(**A**) $6\sqrt{2}$ (**B**) $6\sqrt{3}$ (**C**) $12\sqrt{3}$ (**D**) $\frac{12}{\sqrt{3}}$ (**E**) 12

9. Find the area of the following quadrilateral that has vertices $(1,2),(1,-2),(-2,2)$, and $(-2,-2)$.

(**A**) 12 (**B**) 14 (**C**) 15 (**D**) 16 (**E**) 20

10. Which of the following is the smallest?



(**A**) $\sin X$ (**B**) $\cos X$ (**C**) $\tan X$ (**D**) $\tan Y$ (**E**) $\sin Y$

11. A triangle that has sides of length 6, 12, and 13 is what type of triangle?

I. Acute II. Obtuse III. Scalene

(**A**) I (**B**) II (**C**) III (**D**) I and III (**E**) II and III

12. For a 45-45-90 triangle, the leg has a length of $5\sqrt{3}$. Find the length of the hypotenuse.

(**A**) 5 (**B**) 15 (**C**) $10\sqrt{3}$ (**D**) $5\sqrt{5}$ (**E**) $5\sqrt{6}$

13. Given $V = \frac{4}{3}\pi r^3$ as the volume of a sphere, find the volume if the diameter is 6.

(**A**) 12π (**B**) 24π (**C**) 36π (**D**) 48π (**E**) 288π

14. Find the perimeter of an isosceles triangle if the altitude to the base is 6 and the base is 16.

(**A**) 36 (**B**) 40 (**C**) 42 (**D**) 46 (**E**) 50

15. If the height of a trapezoid is tripled and each base is doubled, how many times larger will the area of the new trapezoid be?

(**A**) 3 times (**B**) 6 times (**C**) 9 times (**D**) 12 times (**E**) 18 times

16. The diagonals of which polygon are always congruent?

(**A**) rhombus (**B**) quadrilateral (**C**) rectangle (**D**) trapezoid (**E**) parallelogram

17. The base of a triangle equals four times its height. If the area is 18, find the sum of the base and the height?

(**A**) 10 (**B**) 11 (**C**) 12 (**D**) 13 (**E**) 15

18. What is the ratio of the area of a circle to its circumference?

(**A**) 1:*r* (**B**) *r*:2 (**C**) 1:1 (**D**) 2:*r* (**E**) *r*:1

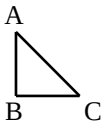
19. ABCD is a trapezoid with median EF, and bases AB and DC. If AB = 2x - 1 , DC = 5x +2, and EF = 3x + 5, find the length of AB.

(**A**) 9 (**B**) 11 (**C**) 13 (**D**) 15 (**E**) 17

20. If *x* is four more than twice the complement of *y*, find the value of $y - x$ in terms of *y*.

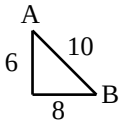
(**A**) $3y - 176$ (**B**) $y - 176$ (**C**) $3y - 184$ (**D**) $-y - 184$ (**E**) $7y - 540$

21. Find the value of AC if BC = 4, $m\angle A = 45^\circ$, and $m\angle C = 45^\circ$.



(**A**) $\frac{4}{\sqrt{2}}$ (**B**) $4\sqrt{2}$ (**C**) $4\sqrt{3}$ (**D**) 8 (**E**) 32

22. Which is the largest fraction?



(**A**) Sin A (**B**) Cos A (**C**) Cos B (**D**) Tan A (**E**) Tan B

23. Find the equation of the circle that has a diameter of 10 and center $(-3,2)$.

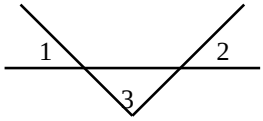
(**A**) $(x-3)^2 + (y+2)^2 = 100$ (**B**) $(x+3)^2 + (y-2)^2 = 100$ (**C**) $(x+3)^2 + (y-2)^2 = 5$

(**D**) $(x-3)^2 + (y+2)^2 = 25$ (**E**) $(x+3)^2 + (y-2)^2 = 25$

24. If the radius of a cone is tripled and the height is doubled, how many times larger will the volume of the cone be?

(**A**) 5 (**B**) 6 (**C**) 12 (**D**) 18 (**E**) 36

25. The measure of $\angle 1$ is greater than the measure of $\angle 3$ by $(2x)^\circ$. If the $m\angle 3 = 14^\circ$, find the measure of $\angle 2$.



(**A**) $152^\circ - (2x)^\circ$ (**B**) $152^\circ + (2x)^\circ$ (**C**) $162^\circ - (2x)^\circ$ (**D**) $166^\circ - (2x)^\circ$ (**E**) $166^\circ + (2x)^\circ$

GEOMETRY TEST 4 ANSWERS

1. D	2. B	3. A	4. E	5. C
6. B	7. A	8. E	9. A	10. A
11. D	12. E	13. C	14. A	15. B
16. C	17. E	18. B	19. E	20. C
21. B	22. D	23. E	24. D	25. A

1. $V = lwh = 2(4)(8) = 64$
2. 2 angle bisectors
3. 8
4. $\frac{x}{z} = \frac{w}{y}$
5. 3
6. $S = (n-2)180^\circ = 1000 \cdot 180^\circ = 180,000^\circ$
7. $\frac{8}{7 \cdot 24} = \frac{1}{21}$
8. $h = 2s = 2 \cdot 6 = 12$
9. $3 \times 4 = 12$
10. $\sin X$
11. acute and scalene
12. $h = \sqrt{2}s = \sqrt{2} \cdot 5\sqrt{3} = 5\sqrt{6}$
13. $V = \frac{4}{3}\pi(3)^3 = 36\pi$
14. The congruent legs will equal $\sqrt{6^2 + 8^2} = 10$. Therefore the perimeter equals $10 + 10 + 16 = 36$.
15. A= $\frac{1}{2}(3h)(2b_1 + 2b_2) = 6\left[\frac{1}{2}h(b_1 + b_2)\right]$
16. The diagonals of a rectangle are congruent.
17. $A = \frac{1}{2}bh \rightarrow 18 = \frac{1}{2}(4h)h \rightarrow h = 3;\ b = 12;\ h + b = 15$
18. $\frac{A}{C} = \frac{\pi r^2}{2\pi r} = \frac{r}{2}$
19. $2x - 1 + 5x + 2 = 2(3x + 5) \rightarrow x = 9$ Solving for AB yields $2x - 1 = 2(9) - 1 = 17$
20. $x = 4 + 2(90 - y) = 184 - 2y \rightarrow y - x = y - (184 - 2y) = 3y - 184$
21. For a $45^\circ - 45^\circ - 90^\circ$ triangle, $h = (leg)\sqrt{2} = 4\sqrt{2}$. If a student did not know this, they could still solve it by using the Pythagorean theorem.
22. $\tan A = \frac{8}{6}$
23. $(x-h)^2 + (y-k)^2 = r^2 \rightarrow (x+3)^2 + (y-2)^2 = 25$
24. $V_1 = \frac{1}{3}\pi r^2 h \rightarrow V_2 = \frac{1}{3}\pi(3r)^2(2h) = 18\left(\frac{1}{3}\pi r^2 h\right) = 18V_1$
25. Since vertical angles are congruent, $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$. Therefore $m\angle 2 = 180^\circ - m\angle 3 - m\angle 1 = 180^\circ - 14^\circ - (14^\circ + 2x) = 152^\circ - 2x$