

Middleton Geometry Individual Sol.

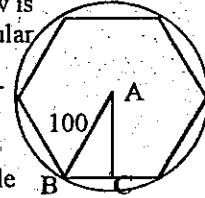
3/8/2003

Solutions: Individual Test
Geometry, March Regional

1. B.
2. Points which lie on the perpendicular bisector of a segment are equidistant from the endpoints of the segment. Choice C.
3. The volume is $\pi r^2 h = 400\pi$; Divide by 2 cu. cm, gives 628 to the gram. Choice A.
4. Choice A. The negation of the statement.
5. Two dimensions doubled gives 4 times the original volume: A.
6. $2y-11 = -y+46$; $y=19$. Thus angle 3 measures $2(19)-11=27$. Choice A.
7. $81 = (AD)(AD + DC)$ by the geometric mean formula. Using the Pythagorean Theorem, we get $AC = \sqrt{97}$, so $AD = \frac{81\sqrt{97}}{97}$ which is not a choice. Choice E.
8. It MAY be equilateral but it MUST be isosceles. Choice C.
9. $\pi(200)(r^2) = 2513$. To the nearest whole number, the radius is 2, Choice B.
10. The probability is $\frac{\pi x^2}{\pi(4x)^2}$ which reduces to 1/16, choice B.
11. $Area = \frac{1}{2}(ED)(DF) \sin 35$ which gives approximately 34.4, choice E.
12. Average each coordinate: (1/2, -13/2). D.
13. The half-planes do not intersect: Choice C.
14. B.
15. Using the geometric mean formula:
 $(CA)^2 = 12(12 + 3)$ so $CA = 13.42$ approximately. Choice D.
16. D.
17. $\frac{50}{360}(\pi \cdot 6 \cdot 6) \approx 15.7$ which is choice B.
18. The midpoint (0, -4) is the center of the circle, and the distance between the two points is the diameter, 14. So $r=7$ and the equation of the circle is choice B.
19. $\frac{45}{360}(64\pi) = 8\pi$; Choice A.

20. The radius and the side of the triangle make a 30 degree angle. With the apothem we have a 30-60-90 triangle, and the long leg is $5\sqrt{3}$. Thus the radius is the hypotenuse 10, choice B.

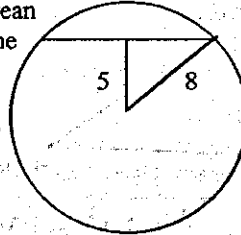
21. The angle ABC below is 60 degrees since a regular hexagon has 120 deg.



angles. So $AC = 50\sqrt{3}$ which is choice D.

22. Angle AOB and Angle C are supplementary. So angle O is 138 degrees, choice B.

23. Using the Pythagorean Theorem to get half the

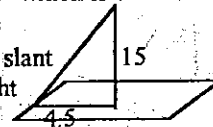


chord is $\sqrt{39}$ so the chord is twice this which is choice C.

$$24. \frac{15-x}{x} = \frac{7}{3}$$

solves to 4.5 which is choice A.

25. Using the Pyth. Theorem to get slant height



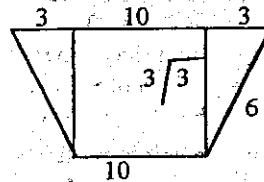
we get slant ht = $\frac{3}{2}\sqrt{109}$ and thus the

lateral area is four triangles, each with area

$$\frac{1}{2} \left(\frac{3}{2} \sqrt{109} \right) (9) \text{ which reduces to}$$

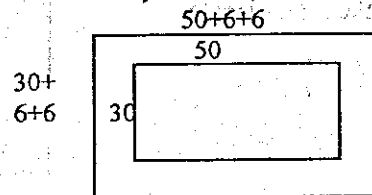
$$27\sqrt{109} \text{ which is choice A.}$$

26. The height is the long leg of a 30-60-90 triangle with hypotenuse (BC).
Area =



$$\frac{1}{2} (3\sqrt{3})(10 + 16) = \text{choice D}$$

27.



27. Continued.

The area of the sidewalk is (62)(42) minus 50(30) which gives 1104, choice C.

29. $15x=360$, so $5x=120$, which is the measure of the largest angle. Choice D.

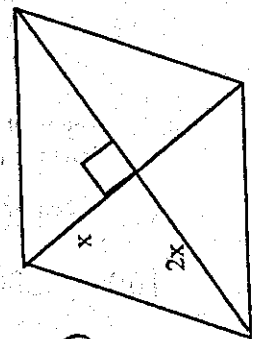
$$30. \frac{1}{2}n(n-3) = 20, n(n-3) = 40$$

and since $40=8(5)$, we can say $n=8$.
Choice B.

$$\text{So } \frac{1}{2}(x)(2x) = 80 \text{ solves to } x = 4\sqrt{5}$$

and the diagonals are thus $8\sqrt{5}$ and

$16\sqrt{5}$. Use the Pythagorean Th to get the side is 10, and then the perimeter is 40.
Choice C.



$$28. Area = \frac{1}{2}(d_1)(d_2)$$