*NOTA = None Of These Answers* **Figures Not Drawn To Scale**

1. Which of the following quadrilaterals is not a parallelogram?

A) square B) kite C) rhombus D) rectangle E) NOTA

2. Two Circles are externally tangent to each other such that the diameter of ⊙*F* is one base of an isosceles trapezoid and the diameter of ⊙*L* is the other base of the same isosceles trapezoid. If the length of *FL* is $\frac{1}{π}$ , what is the area of the trapezoid?

 F L

A) $\frac{1}{π^{2}}$ B) $\frac{1}{2π^{2}}$ C) 1 D) 2 E) NOTA

3. A hexahedron has surface area of 1176. What is the perimeter of one of its faces?

A) 56 B) 28 C) 42 D) 196 E) NOTA

4. A rectangle *ABCD* has coordinates *A*(-2,3), *B*(-5,-3), and *D*(0,2). What are the coordinates of *C*?

A) (-4, -1) B) (-3,-4) C) (-1,4) D) (1,-6) E) NOTA

5. Which of the following is(are) not a characteristic of a parallelogram?

 I. congruent diagonals

 II. adjacent sides perpendicular

 III. opposite angles congruent

A) III only B) I only C) II & III only D) I & II only E) NOTA

6. The diagonals of a rhombus measure 24 and 32. What is the length of one of the sides?

A) 40 B) 384 C) 160 D) 80 E) NOTA

7. The measures of the angles of a kite are (7x+9)°, (8x)°, (5x+45)°, and (9x-13)°. What is half the measure of one of the congruent pairs of angles in the kite?

A) 44° B) 88° C) 43° D) 86° E) NOTA

8. Given rectangle *VERO* whose ratio of length, *VE*, to width, *VO* is 7 to 2. If *M* is the midpoint of *ER* and *OM* = 20, what is the perimeter of *VERO*? V E

 M

 O R

A) 40 B) $36\sqrt{2}$ C) $32\sqrt{2}$ D) 18 E) NOTA

9. Given parallelogram *GRAM*, find *x*. G 20° 45° M

  x°

 R 150°  A

A) 160 B) 30 C) 50 D) 135 E) NOTA

10. Given isosceles trapezoid *PART* with legs *AP* and *RT* and measurements given, find the length of the median.

 A 20 R

 (2x)°

 14

 x°

 P T

A) 27 B) $7\sqrt{3}$ C) 189 D) $40+14\sqrt{3}$ E) NOTA

11. In figure *QUAD*, *AD⎮⎮ UQ*, *QU* = *QD* = 12, *m∠U* = 30°, and *m∠D* = 45°. Find *AU*.

 A D

 U Q

A) $6\sqrt{6}$ B) $12\sqrt{2}$ C) 24 D) $24\sqrt{2}$ E) NOTA

12. The diagonals of a kite are in the ratio 1:3. If the area of the kite is 54, what is the sum of the diagonal lengths?

A) $12\sqrt{3}$ B) 18 C) 24 D) 6 E) NOTA

13. A square with sides lengths of 5 is doubled and then doubled again. What is the ratio of the areas between the final square to the original square?

A) 1:4 B) 1:8 C) 8:1 D) 16:1 E) NOTA

14. Let *M* represent the set of all trapezoids, a quadrilateral with one pair of parallel sides. Let *A* represent the set of all kites. Let *T* represent the set of all rectangles. Let *H* represent the set of all parallelograms. Which of the following statements is true?

A) H ⊂ T B) A∈ H C) M ∩ T = ∅ D) T ∪ M = H E) NOTA

15. Given rectangle *FLAS* with *LO* = *OR* = *RA* = 5 and *AN* = *NG* = *GE* = *ES* = 4. Find the area of the un-shaded region.

 F L

 O

 R

 S E G N A

A) 40 B) 100 C) 140 D) 200 E) NOTA

16. The lengths of the diagonals of a rhombus are 18 and 24. What is the rhombus' height?

A) 14.4 B) 15 C) 60 D) 7.2 E) NOTA

17. In isosceles trapezoid *TRAP*, *TR⎮⎮PA*, *m∠R* = 30°, *X* and *Y* are midpoints of *AR* and *PT* respectively. If *XY* = 26 and the height of the trapezoid is 12, what is the perimeter of *TRAP*?

A) 156 B) 48 C) 52 D) 100 E) NOTA

18. Find the product of the diagonals of the rhombus shown. 10

 120°

A) $100\sqrt{3}$ B) $25\sqrt{3}$ C) $50\sqrt{3}$ D) 40 E) NOTA

19. In the given figure *CD* is horizontal, *AB* is vertical, and points *A*, *B*, and *E* are collinear. Additionally, *AD* = 20, *DC* = 22, *m∠C* = 60°, and *CE* = 6. Find the exact length of *AB*.

 A

 B

 D E C

A) 6(2-$\sqrt{3}$) B) 12 C) 2(6-$\sqrt{3}$) D) 12($\sqrt{3}$ - 1) E) NOTA

20. Quadrilateral *GATR* is inscribed in a circle. Find *m∠G* if *m∠R* = (17x+32)°, *m∠T* = (9x+43)°, and *m∠A* = (21x-4)°.

A) 11° B) 101° C) 79° D) 80° E) NOTA

21. Given rhombus *RHOM* with *R*(-2,3) and *O*(1,5), find the equation of the line segment *HM*.

A) 6x+4y= 13 B) 2x-3y= -13 C) 3x+2y= 13 D) 12x+4y= 13 E) NOTA

22. Given the three squares with lengths shown, vertices *S*, *A*, and *M* are collinear. Find *x*.

 M

 A

 S

 4 7 x

A) 5.25 B) $\frac{49}{4}$ C) 10 D) $\sqrt{82}$ E) NOTA

23. The Shaded part of the figure is made of five congruent rectangles. Figures J and M are congruent squares. Each shaded rectangle has a base length twice the height length. If the perimeter of the entire figure is 56, find the area of one shaded rectangle.

 J M

A) 32 B) 24 C) 160 D) 48 E) NOTA

24. The diagonal of a rectangle creates a 30°-60°-90° triangle. If the length of the diagonal is 30, what is the area of the rectangle?

A) $225\sqrt{3}$ B) 450 C) 675 D) 300 E) NOTA

25. The difference between a pair of adjacent sides of a parallelogram is four. The measure of one angle is 120°. If the area of the parallelogram is $30\sqrt{3}$, find the sum of the two adjacent sides.

A) 10 B) 20 C) 8 D) 16 E) NOTA

26. The given figure is composed of congruent squares. If the number of centimeters in the perimeter of the figure is equal to the number of square centimeters in the area, what is the length of one side of a square?

A) $2\sqrt{2}$ B) 1 C) 2 D) 4 E) NOTA

27. Use the figure given in Question #26. Is the figure a net drawing of a cube?

A) Yes B) No, not enough squares

C) No, too many squares D) No, incorrect order E) NOTA

28. A quadrilateral inscribed in a circle has side lengths of 10, 6, 4, and 8. Find the area.

A) $8\sqrt{30}$ B) $6\sqrt{30}$ C) $6\sqrt{15}$ D) $12\sqrt{15}$ E) NOTA

29. A square with Area = 64 is rotated about one of its diagonals. Find the volume of the solid formed.

A) $\frac{128π\sqrt{2}}{3}$ B) $32π\sqrt{3}$ C) $\frac{256π\sqrt{2}}{3}$ D) $\frac{512π\sqrt{2}}{3}$ E) NOTA

30. A rectangle and a square have the same area. The length of the square's diagonal is $6\sqrt{2}$. If the length of the base of the rectangle is one-fourth the length of the height of the rectangle, what is the rectangle's perimeter?

A) $30\sqrt{2}$ B) 30 C) 60 D) 90 E) NOTA