

Geometry Regional Test

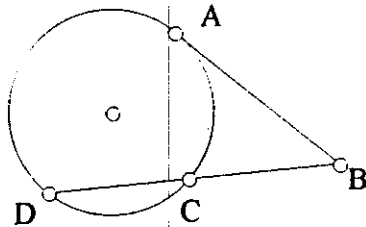
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Answer "E" on this test means none of the above.

1. Find the coordinates of the midpoint of the line segment with endpoints (6.5,4) and (1.5,-1).  
 A. (2.5,1.5)      B. (4,2.5)      C. (1.5,4)      D. (4,1.5)      E. NOTA
2. The ratio of the measure of an interior angle to the measure of an exterior angle of a regular polygon is 5:1. Find the sum of the interior angles.  
 A.  $120^\circ$       B.  $360^\circ$       C.  $1650^\circ$       D.  $1800^\circ$       E. NOTA

3. Given:  $\overline{AB}$  is tangent to the circle at A,  $DC = 20$ ,  $AB = 24$ . Find BC

- A. 7
- B. 12
- C. 14
- D. 16
- E. NOTA

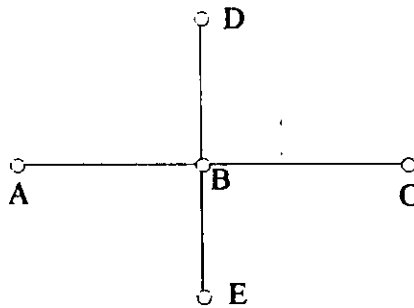


4. The ratio of the area of two similar triangles is 16:9. If the perimeter of the larger triangle is 12, find the perimeter of the smaller triangle.  
 A.  $6\frac{3}{4}$       B.  $7\frac{1}{2}$       C. 8      D. 9      E. NOTA

5. In the figure,  $AC = 24$ ,  $AB = 6x - 6$ ,  $BC = 5x - 3$ , and  $BE = 5x - 12$ . Which must be true?

- I.  $\overline{AC}$  bisects  $\overline{DE}$       II.  $\overline{DE}$  bisects  $\overline{AC}$       III.  $\overline{DE}$  bisects  $\overleftrightarrow{AC}$

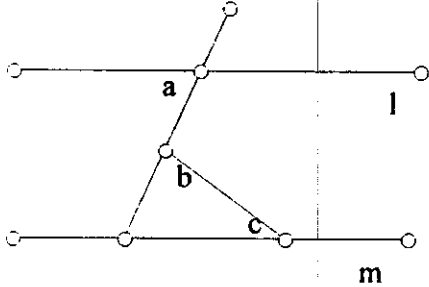
- A. I only
- B. II only
- C. III only
- D. II & III only
- E. NOTA



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6. In the figure, if  $l \parallel m$ ,  $a=65^\circ$ ,  $c=45^\circ$ , then  $b - c = ?$

A.  $20^\circ$     B.  $25^\circ$     C.  $65^\circ$     D.  $70^\circ$     E. NOTA



7. Which of the following statements has the statement, its contrapositive its converse, and its inverse all true ?

I. If  $a$  and  $b$  are even, then  $a + b$  is even.

II. Vertical angles are congruent.

III. If two lines form congruent adjacent angles, the lines are perpendicular.

A. I only    B. II only    C. III only    D. II and III only    E. NOTA

8. Let GEOM be an isosceles trapezoid with a perimeter of 28 and  $\overline{GE} \parallel \overline{OM}$ . Find the area, in square units, of GEOM if  $GE = 8$  and  $OM = 12$ .

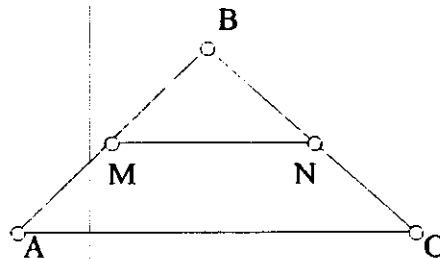
A.  $12\sqrt{3}$     B.  $18\sqrt{3}$     C.  $20\sqrt{3}$     D.  $40\sqrt{3}$     E. NOTA

9. The measures of the interior angles of a pentagon are represented by  $4x$ ,  $7x$ ,  $8x - 30$ ,  $5x - 10$ , and  $4x + 20$ . Find the sum of the measure of the smallest angle and the measure of largest angle.

A.  $80^\circ$     B.  $140^\circ$     C.  $220^\circ$     D.  $230^\circ$     E. NOTA

10. If  $\overline{MN} \parallel \overline{AC}$ ,  $BC = 21$ ,  $NC = 9$ ,  $AM = 6$ , find  $BM$ .

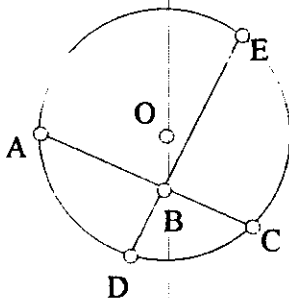
A. 5.5  
B. 6  
C. 9  
D. 14  
E. NOTA



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11. Two interior angles on the same side of the transversal which cuts two parallel lines are bisected by lines which meet at A. Find the measure of angle A.  
 A.  $45^\circ$     B.  $50^\circ$     C.  $60^\circ$     D.  $90^\circ$     E. NOTA
12. If a circle is inscribed within a square whose side measures 11 cm, what is the circumference of the circle?  
 A.  $11\pi$  cm    B.  $\frac{11}{2}\pi$  cm    C.  $121\pi$  cm    D.  $\frac{121}{4}\pi$  cm    E. NOTA
13. A right angle is trisected and each of the three resulting angles is bisected. Which of the following could NOT be the degree measure of an angle formed by any two of these rays?  
 A. 15    B. 40    C. 60    D. 75    E. NOTA
14. In isosceles triangle ABC, the height  $\overline{BD}$  to the base is 8. If the sum of the legs is 20, find the area of triangle ABC.  
 A. 24    B. 40    C. 48    D. 96    E. NOTA
15. In the circle O, chords  $\overline{AC}$  and  $\overline{DE}$  intersect at point B. If  $AB = 9x$ ,  $BC = x$ ,  $BE = 3x + 6$ ,  $DB = 3$ , find the length of  $\overline{AC}$ .

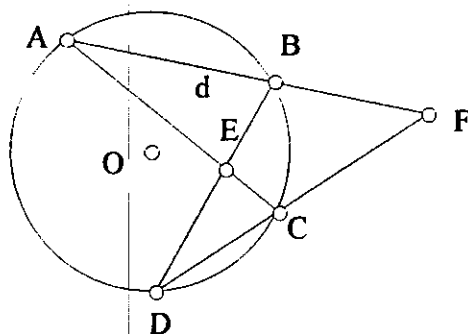
- A. 2  
 B. 10  
 C. 15  
 D. 20  
 E. NOTA



16. The ratio of the diagonal of a face of a cube to a diagonal of the same cube is  
 A.  $\sqrt{3} : 3$     B.  $2\sqrt{3} : 3$     C.  $\sqrt{6} : 3$     D.  $2 : 3$     E. NOTA

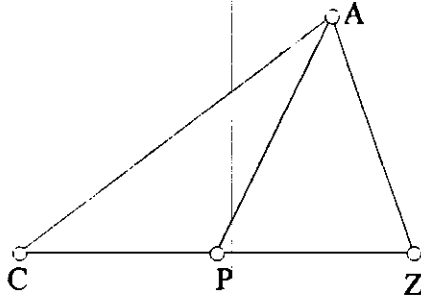
17. In circle O,  $m\widehat{AB} = 90$ ,  $m\widehat{CD} = 80$ ,  $m\angle F = 30$ .  
Find the  $m\angle BEC$ .

- A. 30  
B. 60  
C. 65  
D. 95  
E. NOTA

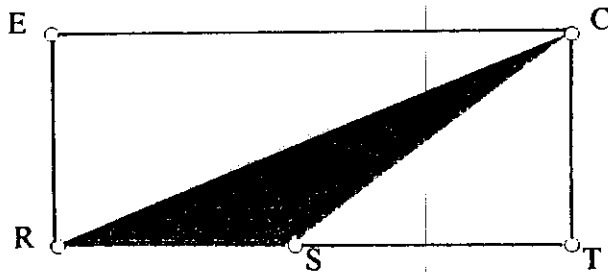


18. What is the length of an arc formed by a  $45^\circ$  central angle if the diameter of the circle is 16 ?  
A.  $2\pi$     B.  $4\pi$     C.  $8\pi$     D.  $32\pi$     E. NOTA
19. Opposite sides of a regular hexagon are 6 units apart. Find the measure of a side of the hexagon.  
A.  $3\sqrt{2}$     B.  $\frac{5}{2}\sqrt{2}$     C.  $\frac{9}{4}\sqrt{3}$     D.  $2\sqrt{3}$     E. NOTA
20. How many sides does a polygon with exactly 104 diagonals have ?  
A. 14    B. 15    C. 16    D. 17    E. NOTA
21. Point G is on side  $\overline{MA}$  of square MATH. If  $AG = \sqrt{3}$  and  $GT = 2\sqrt{3}$ , then the area of the square, in square units, is  
A.  $\sqrt{3}$     B. 3    C.  $2\sqrt{3}$     D. 9    E. NOTA
22. In  $\triangle ABC$ ,  $AB = 8$ ,  $m\angle A = 30^\circ$ , and  $m\angle C = 45^\circ$ .  
Find BC.  
A. 4    B.  $4\sqrt{2}$     C.  $4\sqrt{3}$     D. 5    E. NOTA
23. A triangles' vertices are the midpoints of a second triangle. If the area of the first triangle is  $K$ , what is the area of the larger triangle ?  
A.  $4K$     B.  $3K$     C.  $\frac{3}{2}K$     D.  $2K$     E. NOTA
24. The lengths of the sides of a triangle measure 6, 9, and  $x$ . what are the limitations of  $x$ ?  
A.  $x > 0$     B.  $x < 15$     C.  $3 < x < 15$     D.  $0 < x < 15$     E. NOTA

25.  $\overline{AP}$  is a median of the triangle and  $AP = ZP$ .  
 If  $m\angle C = 57^\circ$ , find the measure of  $\angle Z$ .  
 A.  $30^\circ$     B.  $57^\circ$     C.  $66^\circ$     D.  $114^\circ$     E. NOTA



26. Find the perimeter of the shaded region in rectangle RECT where  $ER=1$ ,  $TR$  is twice  $ER$ , and  $S$  is the midpoint of  $RT$ .



- A.  $\sqrt{2} + \sqrt{3} + 2$     B.  $\sqrt{2} + \sqrt{5} + 1$     C.  $\sqrt{5} + 1$     D.  $\frac{1}{2}$     E. NOTA
27. How many degrees are in the acute angle formed by the hour and minute hands of a clock at 3:15 ?  
 A. 90    B. 15    C. 7.5    D. 0    E. NOTA
28. The coordinates of a polygon are  $(0,0)$ ,  $(2,4)$ ,  $(6,4)$ ,  $(8,0)$ , and  $(3,-3)$ . Find the area of the polygon, in square units.  
 A. 36    B. 39    C. 42    D. 45    E. NOTA
29. The supplement of an angle measures 10 more than three times the complement of the angle. Find the measure of the complement.  
 A.  $70^\circ$     B.  $60^\circ$     C.  $50^\circ$     D.  $40^\circ$     E. NOTA

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30. In the diagram,  $\overline{AF} \parallel \overline{BE}$ ,  $m\angle AGC = 57^\circ$ ,  $m\angle CDE = 143^\circ$ , find  $m\angle GCD$ .

- A.  $94^\circ$     B.  $97^\circ$     C.  $100^\circ$     D.  $102^\circ$     E. NOTA

