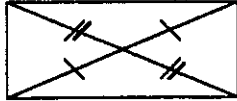


Lehigh

For each of the following choose the best answer. Choose "E" for none of the above.

1. Based only on the markings shown, select the answer that best describes the parallelogram.



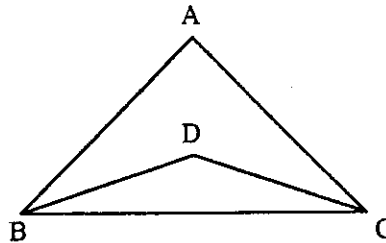
- a. rectangle b. parallelogram c. rhombus d. square e. nota

2. The supplement of an angle is 60° less than twice the supplement of the complement of the angle. Find the measure of the complement.

- a. 30° b. 70° c. 20° d. 60° e. nota

3. \overline{BD} bisects $\angle ABC$, \overline{CD} bisects $\angle ACB$ in the figure below. The equation used to find the measure of angle D is

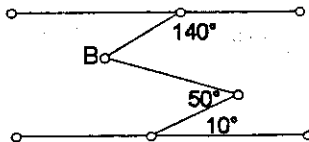
- a. $m\angle D = 90 + \frac{1}{2}(m\angle A)$
 b. $m\angle D = 45 + \frac{1}{2}(m\angle A)$
 c. $m\angle D = 90 + m\angle A$
 d. $m\angle D = 45 + m\angle A$
 e. nota



4. A, B, and C are collinear points such that B is between A and C. $AB = \frac{5}{8}AC$ and $AB = 15$. Find BC.

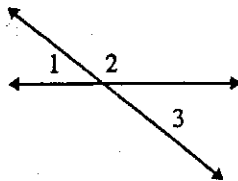
- a. 9 b. $\frac{75}{8}$ c. 24 d. 33 e. nota

5. Find $m\angle B$ in the diagram below



- a. 50° b. 80° c. 40° d. 60° e. nota

6. In the diagram below $m\angle 1 = (2x + 40)^\circ$, $m\angle 2 = (2y + 40)^\circ$, and $m\angle 3 = (x + 2y)^\circ$, find the $m\angle 2$.

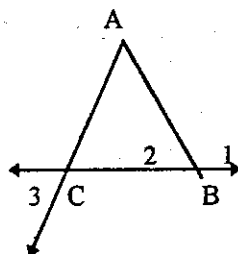


- a. 20° b. 80° c. 30° d. 100° e. nota

7. Find the measure of the acute angle formed by the hands of a clock at 5:40a.m.

- a. 90° b. 70.5° c. 70° d. 80° e. nota

8. \overline{AB} and \overline{AC} are legs of isosceles $\triangle ABC$, $m\angle 1 = 5x$ and $m\angle 3 = 2x + 12$. Find $m\angle 2$.

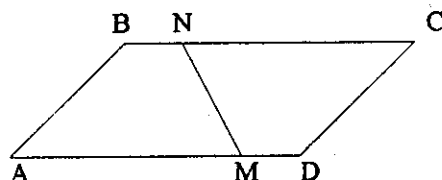


- a. 60° b. 24° c. 120° d. 20° e. nota

9. $\triangle ABC$ has coordinates $A(4, 8)$, $B(2,1)$, and $C(12,3)$. \overline{AM} is a median of $\triangle ABC$, find the length of \overline{AM} .

- a. $\sqrt{145}$ b. $5\sqrt{3}$ c. $3\sqrt{3}$ d. $3\sqrt{5}$ e. nota

10. ABCD is a parallelogram with perimeter 60. $\overline{NC} \cong \overline{AM}$ and the perimeter of ABNM is 36. Find NM.



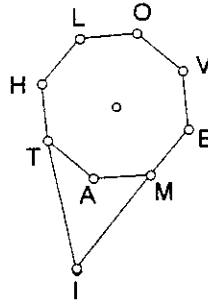
- a. 10
b. 6
c. 12
d. 9
e. nota

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11. Two sides of a right triangle are of length 8 and 15. Find the third side.

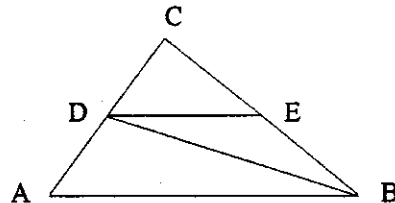
- a. 23 b. $\sqrt{161}$ c. 17 d. $\sqrt{7}$ e. nota

12. LOVEMATH is a regular octagon. \overline{EI} and \overline{HI} intersect at I. What is the measure of $\angle MIT$?



- a. 67.5° b. 55° c. 135° d. 45° e. nota

13. In triangle ABC, $\overline{DE} \parallel \overline{AB}$, $m\angle EBD = m\angle DBA$, $m\angle C = 80^\circ$, and $m\angle A = 60^\circ$. Find $m\angle EDB$.



- a. 40° b. 35° c. 20° d. 25° e. nota

14. If the measure of each angle of a regular polygon is greater than 120° , the number of sides of the polygon is

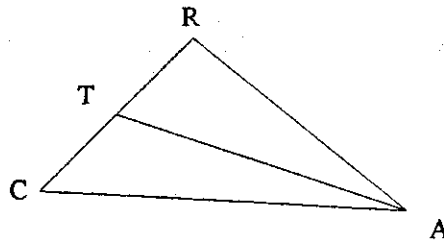
- a. 6 b. at least 7 c. at most 6 d. 7 e. nota

15. Trapezoid ABCD with $\overline{AB} \parallel \overline{CD}$, has median \overline{XY} , $AB = 12\text{cm}$, and $XY = 17\text{cm}$. Find CD.

- a. 5 b. 24 c. 22 d. 29 e. nota

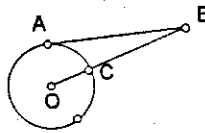
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16. In triangle CAR , \overline{AT} is the bisector of $\angle CAR$, $AC = 6$, $AR = 8$, and $CR = 4$. Find TR .



- a. $\frac{12}{7}$ b. 2 c. $\frac{16}{7}$ d. 3 e. nota

17. In the figure, AB is tangent to circle O at A . If $AB = 20$ and $BC = 12$, find the length of OC .

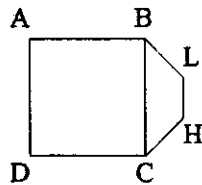


- a. $\frac{64}{3}$ b. $\frac{5}{3}$ c. 55.25 d. $\frac{32}{3}$ e. nota

18. $ABCD$ is an isosceles trapezoid with upper base \overline{AD} . \overline{AC} and \overline{DB} intersect at E . If $BE = x + 7$, $CE = y - 3$, $AE = x + 5$, and $BD = y + 4$, find AC .

- a. 16 b. 14 c. 9 d. 12 e. nota

19. $ABCD$ is a square and $BLHC$ is half of a regular hexagon. Find the perimeter of polygon $ABLHCD$ if LH is 6.



- a. 48 b. 54 c. 36 d. 46 e. nota

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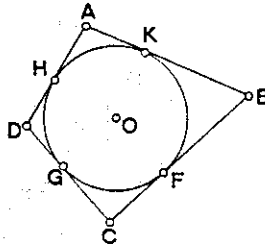
26. If $\angle 1$ and $\angle 2$ are vertical angles, find x if $m\angle 1 = 4x^2$ and $m\angle 2 = 35 - 4x$.

- a. -3.5 or -2.5 b. -2.5 c. 3.5 or 2.5 d. -3.5 e. nota

27. Find the area of a triangle with sides 10, 17, and 21.

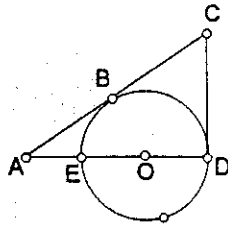
- a. 17.1 b. 84 c. 85 d. 178.5 e. nota

28. In the figure below, quadrilateral ABCD is circumscribed about circle O with the points G, F, H, and K lying on circle O. $DG = 2$, $CF = 4$, $AK = 3$, and $KB = 5$. Find the perimeter of quadrilateral ABCD.



- a. 28 b. 14 c. 21 d. 29 e. nota

29. In circle O, B and D are points of tangency, and \overline{ED} is a diameter. $AB = 4\sqrt{3}$ and $OB = 4$. Find measure of arc BDE.



- a. 60° b. 330° c. 30° d. 300° e. nota

30. The radius of a circle circumscribing an equilateral triangle is 6. Find the radius of the circle which is inscribed in the triangle.

- a. $2\sqrt{3}$ b. 3 c. 4 d. $3\sqrt{3}$ e. nota