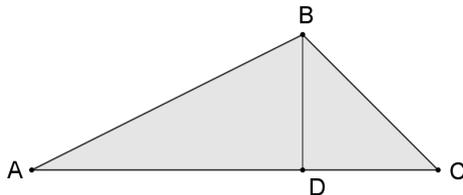


For all questions, answer choice (E) NOTA means that none of the given answers are correct. Note that figures are not necessarily drawn to scale. Good Luck!

- A triangle has two interior angles measuring 64° and 79° . Solve for the third angle in degrees.
(A) 11 (B) 26 (C) 37 (D) 217 (E) NOTA
- Circle A has a diameter of length 8 and circle B has a radius of length 7. Find the positive difference between their circumferences.
(A) 8π (B) 6π (C) 5π (D) 10π (E) NOTA
- Find the distance between the points (11, 1) and (9, 5).
(A) $2\sqrt{5}$ (B) 10 (C) 6 (D) $4\sqrt{5}$ (E) NOTA
- The diagonals of a rhombus measure 72 cm and 96 cm. Find its perimeter in centimeters.
(A) 336 (B) 240 (C) 3456 (D) 130 (E) NOTA
- The alternate interior angles of two parallel lines measure $(2x + 75)^\circ$ and $(3x)^\circ$. Solve for x .
(A) 57 (B) 21 (C) 3 (D) 75 (E) NOTA
- A triangle has two sides measuring 6 and 12 units in length. The median to the third side has length x . Find the sum of all the possible integral values of x .
(A) 39 (B) 34 (C) 42 (D) 30 (E) NOTA
- If P = the sum of the interior angles of a convex decagon and H = the sum of the exterior angles of a convex undecagon (11-sided polygon), find $\left(\frac{P}{H}\right)^3$.
(A) $\frac{8}{125}$ (B) 27 (C) 4 (D) $\frac{22}{5}$ (E) NOTA
- The number of diagonals in a regular nonagon is equal to half the number of diagonals in another polygon. How many sides does this polygon have?
(A) 14 (B) 10 (C) 12 (D) 8 (E) NOTA
- Tony draws a square with a diagonal of length 20. Its perimeter can be expressed as $x\sqrt{2}$. Chico then draws an equilateral triangle with a perimeter of 36. Its area can be expressed as $y\sqrt{3}$. Find the value of $x - y$.
(A) 8 (B) 4 (C) 12 (D) 16 (E) NOTA

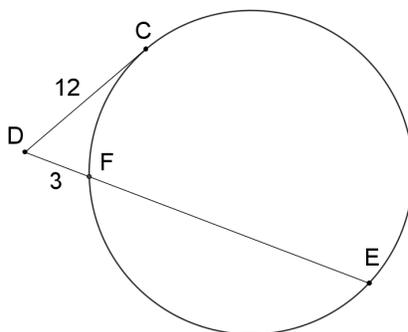
10. In $\triangle CAB$, both $\angle ABC$ and $\angle BDC$ measure 90° . If \overline{AB} measures 6 units and \overline{AD} measures 3 units, find \overline{BD} .



- (A) $3\sqrt{3}$ (B) 9 (C) $3\sqrt{5}$ (D) $3\sqrt{2}$ (E) NOTA
11. Using the same information pertaining to Triangle CAB in the previous problem, find \overline{BC} .

- (A) 9 (B) $3\sqrt{2}$ (C) $6\sqrt{3}$ (D) 3 (E) NOTA

12. Given that DC is tangent to the circle at point C, solve for \overline{DE} .



- (A) 45 (B) 48 (C) 36 (D) 9 (E) NOTA

13. The ratio of the areas between two similar triangles is 9:64. What is the ratio between two corresponding side lengths of the two similar triangles?

- (A) 3:8 (B) 2:9 (C) 4:7 (D) 2:12 (E) NOTA

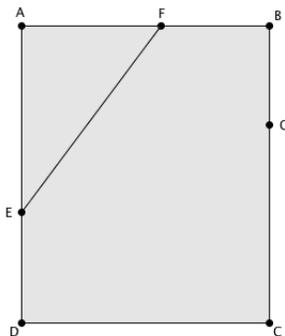
14. The sine of an angle in a right triangle is $\frac{5}{13}$. Find the tangent of that same angle.

- (A) $\frac{5}{12}$ (B) $\frac{12}{13}$ (C) $\frac{13}{5}$ (D) $\frac{12}{5}$ (E) NOTA

15. Kavitha cuts her circular potato cake-patty 8 times. What is the maximum number of pieces she can make?

- (A) 81 (B) 64 (C) 36 (D) 100 (E) NOTA

16. A trapezoid has bases of length x and 4. Let P and H be points on opposite legs of the trapezoid. PH is parallel to the bases and divides the trapezoid into two quadrilaterals of the same area. Given that the length of PH is 6, find the length of x .
- (A) $6\sqrt{3}$ (B) $7\sqrt{3}$ (C) $2\sqrt{14}$ (D) $5\sqrt{5}$ (E) NOTA
17. Linda wins an autographed sphere shaped tennis ball that's perfectly inscribed within a cube shaped box. If the side length of the box is 16 units, find the surface area of Linda's tennis ball.
- (A) 512π units² (B) $\frac{2048}{3}\pi$ units² (C) 256π units² (D) 1024π units² (E) NOTA
18. Points $(6, -1)$, $(-5, 5)$, $(-3, 4)$, and $(1, 7)$ are vertices of a polygon. Find its area.
- (A) 57 (B) 24 (C) 28 (D) 48 (E) NOTA
19. Quadrilateral LMNO is circumscribed around circle P. Given that $MN = 13$ and $OL = 17$, find the perimeter of this quadrilateral.
- (A) 80 (B) 110 (C) 120 (D) 60 (E) NOTA
20. In triangle ABC, $\angle CAB$ measures 60° . The angle bisector of this angle intersects side CB at point D and \overline{CD} is 4 units in length. If the angle bisector is also a median and an altitude of this triangle, find the area of an inscribed circle.
- (A) $\frac{16}{3}\pi$ units² (B) 8π units² (C) 4π units² (D) $\frac{64}{9}\pi$ units² (E) NOTA
21. Alex folds a rectangular sheet of paper about \overline{EF} so that point A coincides with G. \overline{AB} has a length of 5, while \overline{BG} has a length of 2. Find the length of \overline{AF} .



- (A) 3.2 (B) 2.9 (C) 4.1 (D) 3.8 (E) NOTA
22. A rectangular prism has a total surface area of 14 and the length of the longest diagonal within the prism measures 8 units. Find the square of the sum of the height, width, and length.
- (A) 78 (B) 177 (C) 71 (D) 81 (E) NOTA
23. The frustum of a cone has bases with area of 25π and π with a height of 12 units. Find the volume of this frustum.
- (A) 104π units³ (B) 124π units³ (C) 119.2π units³ (D) 116π units³ (E) NOTA
24. Two angles that are supplementary measure $(15x + 70)^\circ$ and $(5x + 10)^\circ$. Solve for the greater angle in degrees.
- (A) 35 (B) 75 (C) 65 (D) 145 (E) NOTA

25. A right triangle is divided into two smaller triangles when an altitude is drawn toward the hypotenuse. If the distance between the incenters of the two smaller triangles is 14, find the inradius of the original triangle.

- (A) $7\sqrt{2}$ (B) $2\sqrt{3}$ (C) $\sqrt{5}$ (D) 3 (E) NOTA

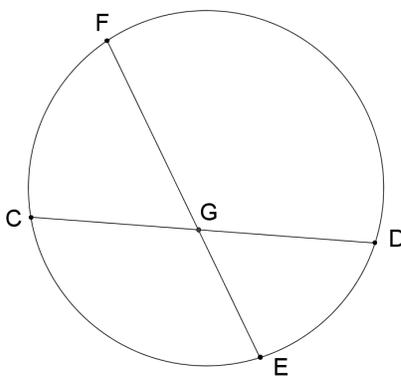
26. A triangle has side lengths measuring 13, 14, and 15. Find its area.

- (A) 91 (B) 88 (C) 72 (D) 84 (E) NOTA

27. What is the converse of the inverse of the contrapositive of the following statement: "If you have chubby cheeks, then I will chub you."

- (A) "If I do not chub you, then you do not have chubby cheeks." (B) "If I do chub you, then you have chubby cheeks."
 (C) "If you do not have chubby cheeks, then I will not chub you." (D) "If you have chubby cheeks, then I will chub you."
 (E) NOTA

28. $\angle CGF$ measures 39° and arc CF measures 57° . Find the measure of arc ED in degrees.



- (A) 48 (B) 18 (C) 21 (D) 9 (E) NOTA

29. Find the area of a sector with a central angle of 90 degrees and a radius of 36.

- (A) 9π (B) 18π (C) 36π (D) 72π (E) NOTA

30. The diagonals of a trapezoid have lengths 17 and 15, and the segment connecting the midpoints of the bases has a length of 4. The height of the trapezoid can be expressed as $\left(\frac{x\sqrt{y}}{y}\right)$. Find $x + y$.

- (A) 294 (B) 301 (C) 312 (D) 298 (E) NOTA