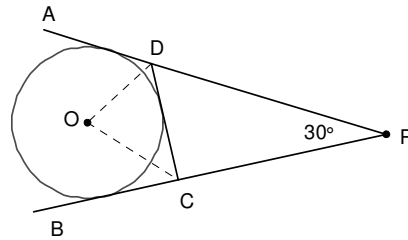


NOTA means: None Of These Answers

1. At 1:15 the hands of a clock determine an angle whose measure is
 A. 14.5° B. 34.5° C. 42.5° D. 52.5° E. NOTA

2. The converse of the inverse of the converse of the conditional $p \rightarrow q$ is
 A. $\sim p \rightarrow \sim q$ B. $p \rightarrow q$ C. $\sim p \rightarrow q$ D. $\sim q \rightarrow p$ E. NOTA

3. $\triangle PCD$ is formed by three tangents to $\odot O$. If $m\angle P = 30^\circ$, then $m\angle DOC = ?$



- A. 75° B. 70° C. 65° D. 60° E. NOTA

4. The hypotenuse of a right triangle is 25 & the altitude to the hypotenuse is 12. Area of $\Delta = ?$.
 A. 350 B. 300 C. 200 D. 75 E. NOTA

5. The sides of a triangle are 10, 12, and 14. The length of the shortest altitude is
 A. $\frac{23}{7}$ B. $\frac{29}{7}$ C. $\frac{24\sqrt{6}}{7}$ D. $\frac{23\sqrt{6}}{6}$ E. NOTA

6. The area of a regular hexagon is $150\sqrt{3}$ sq in. What is the length of the apothem of the hexagon?
 A. $\sqrt{6}$ in B. $5\sqrt{3}$ in C. $5\sqrt{2}$ in D. $(2.5)\sqrt{3}$ in E. NOTA

7. Find the lateral area of a cone with altitude 6 cm and radius of the base 5 cm.
 A. $50\pi \text{ cm}^2$ B. $75\pi \text{ cm}^2$ C. $5\pi\sqrt{61} \text{ cm}^2$ D. $10\pi\sqrt{61} \text{ cm}^2$ E. NOTA

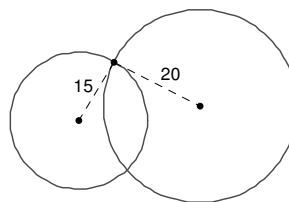
8. Find the volume of the solid formed by revolving a 3-4-5 right triangle about its hypotenuse.
 A. 16π B. 12π C. $\frac{48\pi}{5}$ D. $\frac{144\pi}{5}$ E. NOTA

NOTA means: None Of These Answers

9. The altitudes of a triangle are concurrent in a point known as
 A. incenter B. circumcenter C. orthocenter D. centroid E. NOTA
10. A circle has a radius of 8 in. Find the measure, in radians, of the central angle whose subtended arc is 6π inches.
 A. $\frac{3\pi}{16}$ B. $\frac{3\pi}{8}$ C. $\frac{3\pi}{32}$ D. $\frac{\pi}{3}$ E. NOTA
11. Two complementary angles have measures $4x$ and $6x - 20$. Find the supplement of the smaller angle.
 A. 44° B. 46° C. 134° D. 136° E. NOTA
12. From a point P, (21 inches from the center of a circle of radius 15 inches), a secant is drawn cutting the circle in points A and B. What is the value of $PA \cdot PB$?
 A. 315 B. 225.5 C. 126 D. 216 E. NOTA
13. Find the surface area of a sphere with a 9 in radius.
 A. $972\pi \text{ in}^2$ B. $324\pi \text{ in}^2$ C. $81\pi \text{ in}^2$ D. $729\pi \text{ in}^2$ E. NOTA
14. Right triangle ABC has legs of 11 in and 60 in. The locus of points equidistant from the three sides of the triangle is a point whose distance from the sides is
 A. 5 in B. 30 in C. 30.5 in D. 31 in E. NOTA
15. Which of the following is the equation of a hyperbola?
 A. $\frac{x^2}{7} = \frac{y^2}{5} + 8$ B. $y = 5x^2$ C. $\frac{x^2}{9} = 1 - \frac{y^2}{16}$ D. $(x-2)^2 - 2 = 4y$ E. NOTA
16. The equation $x^2 + y^2 - 2x + 4y + 5 = 0$ represents a
 A. circle B. point C. line D. plane E. NOTA
17. A circle is inscribed in the right triangle with hypotenuse 10 and one leg of 8. The area of the triangle exceeds the area of the circle by
 A. $24 - 4\pi$ B. $24 - 2\pi$ C. $24 - .5\pi$ D. $30 - \pi$ E. NOTA

NOTA means: None Of These Answers

18. Write the equation of the plane determined by $(2, 0, 0)$, $(0, 3, 0)$, $(0, 0, 4)$
 A. $2x + 3y + 4z = 0$ B. $2x + 3y + 4z = 12$ C. $4x + 3y + 2z = 0$ D. $6x + 4y + 3z = 12$ E. NOTA
19. A spherical piece of lead of diameter 8 in is melted and cast into a right circular cone whose base has a diameter of 4 in. What is the height of the cone?
 A. 252 in B. 64 in C. 128 in D. 48 in E. NOTA
20. Find the volume of a frustum of a square pyramid if the area of the larger base is 20 sq in, the area of the smaller base is 5 sq in, and height of the frustum is 15 in.
 A. 525 in^3 B. 150 in^3 C. 2625 in^3 D. 175 in^3 E. NOTA
21. Points P and Q are the midpoints of diagonals \overline{AC} and \overline{BD} respectively, of the isosceles trapezoid ABCD. If the longer base $AB = 100$ and $PQ = 30$, then DC is
 A. 30 B. 35 C. 40 D. 45 E. NOTA
22. The base of an isosceles triangle is $\sqrt{2}$. The medians to the legs intersect each other at right angles. The area of the triangle is
 A. .75 B. 1.5 C. 2.5 D. 3 E. NOTA
23. In right triangle ABC with angle C the right angle, with median \overline{CM} and altitude \overline{CD} , A, B, C, D, are distinct points. If $m\angle MCD = \frac{1}{2} \angle A$, $m\angle A > m\angle B$, then $m\angle MCD$ is
 A. 18° B. 30° C. 36° D. 34° E. NOTA
24. In a sphere of radius 6.5 in, a right circular cylinder is inscribed. If the height of the cylinder is 12 in, the diameter of its base is
 A. 4 in B. 5 in C. 6 in D. 6.5 in E. NOTA
25. As shown, a circle of radius 15 intersects another circle, radius 20. What is the difference of the areas of the non-overlapping portions?



- A. 175π B. 25π C. 450π D. 625π E. NOTA

NOTA means: None Of These Answers

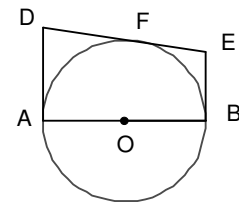
26. The diagonals of a parallelogram are 16 in. and 20 in. and one side of the parallelogram is 12 in. Find the area of the parallelogram.

- A. $50\sqrt{2} \text{ in}^2$ B. $60\sqrt{3} \text{ in}^2$ C. $60\sqrt{7} \text{ in}^2$ D. $60\sqrt{5} \text{ in}^2$ E. NOTA

27. In $\triangle ABC$, the median from C meets \overline{AB} in D. Through M, the midpoint of \overline{CD} , \overline{AM} is drawn intersecting \overline{CB} at P. If $CP = 4$, then $CB = ?$

- A. 6 B. 8 C. 10 D. 12 E. NOTA

28. If \overline{AB} is a diameter and \overline{AD} , \overline{DE} , & \overline{BE} are tangents to $\odot O$, then $FD \cdot FE$ equals



- A. DA^2 B. FO^2 C. EB^2 D. DO^2 E. NOTA

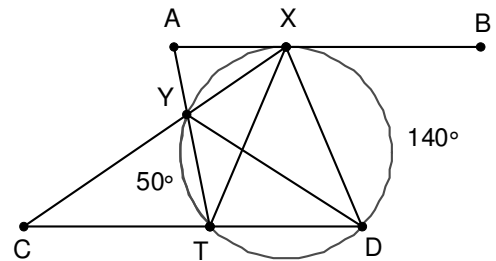
29. Given: \overline{AB} tangent at X

$$\overline{AB} \parallel \overline{CD}$$

$$m\widehat{XD} = 140^\circ$$

$$m\widehat{YT} = 50^\circ$$

Find: $m\angle XAY$



- A. 70° B. 115° C. 105° D. 110° E. NOTA

30. Ten turns of a wire are helically (spirally) wrapped around a cylindrical tube whose outside circumference (circumference of the base) is 4 inches and length (height of cylinder) is 9 inches. The ends of the wire coincide with the ends of the same cylindrical element. That is the wire's ends are the endpoints of a segment (on the lateral surface of the cylinder) that is perpendicular to both bases. Find the length of the wire.

- A. 65 in B. 40 in C. 41 in D. 97 in E. NOTA