

FOR EACH OF THE FOLLOWING CHOOSE THE BEST ANSWER.
CHOOSE "E" FOR NONE OF THE ABOVE.

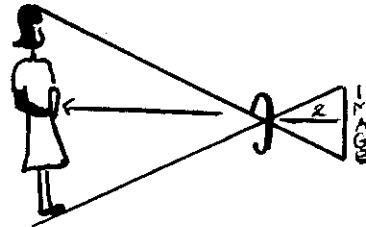
YOU WILL RECEIVE FOUR POINTS FOR EACH CORRECT RESPONSE AND LOSE A POINT FOR EACH INCORRECT RESPONSE. QUESTIONS NOT RESPONDED TO WILL NEITHER GAIN NOR LOSE A POINT.

1. Noncoplanar lines that do not intersect are:
 - a. concurrent
 - b. skew
 - c. parallel
 - d. dihedral

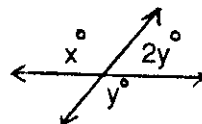
2. What happens to the volume of a cylinder if I double the radius?
 - a. the volume doubles.
 - b. the volume triples.
 - c. the volume quadruples.
 - d. the volume becomes 8 times as large.

3. Which of the following is a biconditional?
 - a. If you pass and finish your chores, you may go.
 - b. Any square is a rectangle
 - c. $x^2 = 16$ if $x = 4$.
 - d. If points are collinear, then they lie on the same line.

4. If a camera lens is 2 cm. from a piece of 35 mm. film, what is the closest distance a 1.75 m. individual can stand to the camera if I'm to capture the entire image?



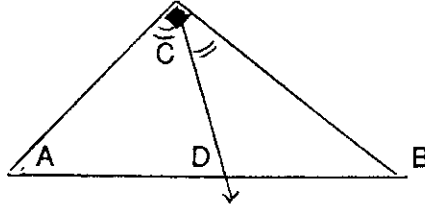
5. Find the value of x .



- a. 30
- b. 60
- c. 120
- d. cannot be determined from the given information.

6. Given CD bisects right $\angle ACB$ of $\triangle ABC$. $AB=10$; $AC=6$; $CB=8$.
 $AD = ?$

- a. $4 \frac{2}{7}$
- b. 5
- c. $3\sqrt{2}$
- d. 3

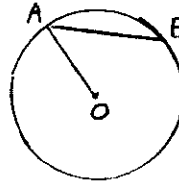


7. What are the measures of the angles of a clock at 2:15?

- a. 45°
- b. 30°
- c. 27°
- d. 22.5°

8. In circle C $m\widehat{AB} = 120$, find $m\angle BAO$.

- a. 30
- b. 60
- c. 45
- d. 120

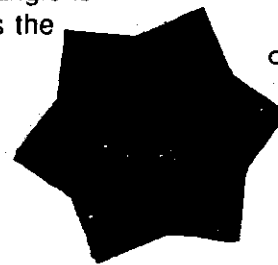


9. The midpoint of the hypotenuse of a right triangle is:

- a. the intersection of the three medians
- b. the incenter
- c. the circumcenter
- d. the intersection of the angle bisectors.

10. On each side of a regular hexagon an isosceles right triangle is drawn. If the perimeter of the hexagon is 36, what is the area of the shaded region?

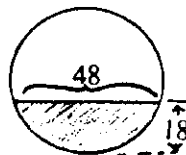
- a. 108
- b. $27\sqrt{2} + 54\sqrt{3}$
- c. $108\sqrt{3} + 108$
- d. $54 + 54\sqrt{3}$



(Each side of the hexagon becomes a hypotenuse.)

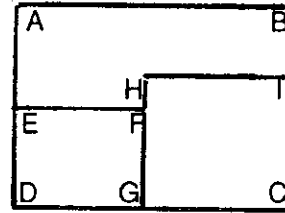
11. A drain pipe contains water 18 cm. deep. The width of the water surface is 48 cm. Find the radius of the pipe.

- a. 24 cm
- b. $18\sqrt{3}$ cm.
- c. 25 cm.
- d. $48 - 18\sqrt{3}$ cm.



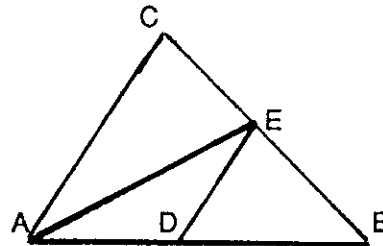
12. If ABCD is square and the area of square DEFG is 36, and the area of square GHIC is 81, find the area of region EFHIBA.

- a. 108
- b. 117
- c. 225
- d. not enough information.



13. Given $\triangle ABC$ with $\angle DEA = \angle CAE$.
 $BE = 8$. $BC = 20$. $BD = 6$. Find AD .

- a. 9
- b. 6
- c. 15
- d. 10

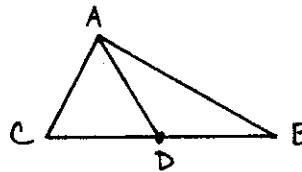


14. The equation of the perpendicular bisector of the segment with endpoints $(-1,2)$ and $(5,-6)$?

- a. $y - 2 = 3/4 (x + 2)$
- b. $y + 4 = 3/4 (x - 2)$
- c. $y = -3/4 x - .5$
- d. $y + 2 = 3/4 (x - 2)$

15. Given $\triangle ABC$ with $m\angle CAD = 70$, $m\angle ACD = 55$, and D the centroid. $AC=12$
 $AD = ?$

- a. 4
- b. 6
- c. 8
- d. 10

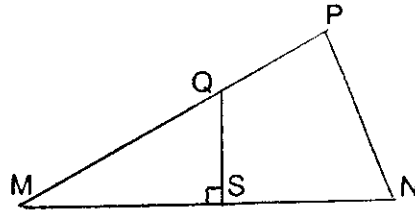


16. Which of the following can be used to prove two quadrilaterals are congruent?

- a. S.S.S.S.
- b. A.A.A.A.
- c. S.A.S.A.S.
- d. S.S.A.S.S.

17. Given the plane figure. $MQ = 6$. $MS = 4$. $NS = 14$. and $PN \perp PM$.
 $QS \perp MS$. Find QP .

- a. 6
- b. 9
- c. $9 \frac{1}{3}$
- d. 21



18. In a parallelogram, two adjacent sides whose lengths are 6 and 16 include an angle whose measure is 60° . Find the length of the shorter diagonal.

- a. $\sqrt{178}$
- b. 32
- c. $26\sqrt{3}/3$
- d. 14

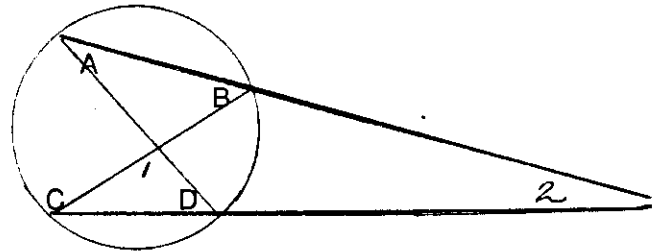
19. The three angles of triangle ABC have measures of 70° , 80° , and 30° . The lengths of the sides of the triangle are 7, 12 and 15. A second triangle, similar to triangle ABC but with 4 times the area is drawn. The length of the side opposite the 70° degree angle in the second triangle is:

- a. 24
- b. 28
- c. 48
- d. 30

20. Given: $m\widehat{AC} = 160$
 $m\widehat{AB} = 50$
 $m\widehat{BD} = 110$

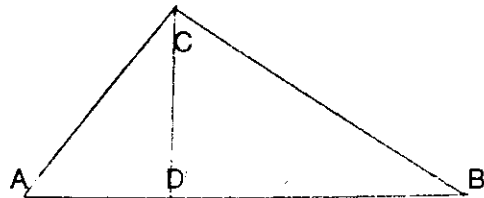
Find $m\angle 1 + m\angle 2$

- a. 35
- b. 70
- c. 180
- d. 140



21. Given right triangle ABC with altitude CD as shown below.
 If $DB = 21$ and $AC = 10$, Find AD.
 (\overline{AB} is the hypotenuse of ABC.)

- a. 5
- b. 25
- c. 14
- d. 4



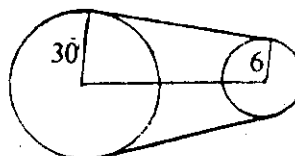
22. A cone is inscribed in a regular square pyramid. What is the volume of the cone if the slant height of the pyramid is 13 and a base edge is 10 inches long?
- 1300π
 - 300π
 - 200π
 - 100π
23. Given a 20 - 70 - 90 triangle with C the right angle, and A the 20 degree angle. If \overline{CD} is the median to the longest side, the measure of $\angle ADC$ is ?
- 20
 - 70
 - 40
 - 140
24. A plane 15 inches from the center of a sphere intersects the sphere in a circle whose area is 400π in². Find the number of inches in the sphere's diameter.
- 10
 - 15
 - 25
 - 50
25. Find the area of a circle whose center is at the origin, if its circumference passes through the point $(2, 2\sqrt{3})$.
- 14π
 - 16π
 - 4π
 - 64π
26. Find the area of a sector of a circle bounded by an arc of 72° and a radius of 15.
- 6π
 - 225π
 - 45π
 - 30π

27. Given the diagonal of a cube is 18 cm. Find the area of a side.

- a. 108
- b. $36\sqrt{3}$
- c. 9
- d. 6

28. Two pulleys are connected by a belt. The radii of the pulleys are 6 cm. and 30 cm. and the distance between the centers is 48 cm. Find the total length of the belt around the pulleys.

- a. $48\sqrt{3}$ cm.
- b. $324\pi + 48\sqrt{3}$ cm.
- c. $612\pi + 48\sqrt{3}$ cm.
- d. $48\sqrt{3} + 44\pi$ cm.



29. The measure of the supplement of an angle is 5 times that of its complement. Find the measure of the complement.

- a. 32.5
- b. 67.5
- c. 112.5
- d. 22.5

30. A regular octahedron has a base edge of 8. Find its volume.

- a. $256\sqrt{14} / 3$
- b. $128\sqrt{14} / 3$
- c. $512\sqrt{2} / 3$
- d. $128\sqrt{3} / 3$