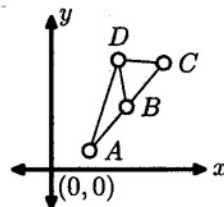


- (22) Two spheres of radii 4 cm and 9 cm, which are touching one another, rest on a flat table. How far apart are the points where each touches the table?
- (A) $4\sqrt{10}$ cm (B) $\sqrt{97}$ cm (C) $\frac{25}{12}$ cm (D) 10 cm (E) 12 cm
- (23) How many lines of symmetry does a regular octagon have?
- (A) 8 (B) 12 (C) 16 (D) 24
- (24) If the vertex angle of an isosceles triangle measures $24^\circ 20'$, then each base angle measures:
- (A) $77^\circ 20'$ (B) $75^\circ 40'$ (C) $77^\circ 50'$ (D) $77^\circ 40'$ (E) $76^\circ 50'$
- (25) Point P is nine units from the center of a circle with radius 15. How many different chords of the circle contain P and have integral lengths?
- (A) 4 (B) 6 (C) 8 (D) 12 (E) 14

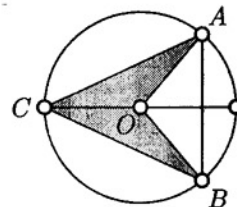
- (26) In the figure, points A , B , and C are collinear and $AB = BC = BD$. If the slope of \overline{AD} is $\frac{5}{4}$, what is the slope of \overline{DC} ?

- (A) $\frac{-3}{5}$ (B) $\frac{-4}{5}$ (C) $\frac{-5}{4}$ (D) $\frac{-5}{3}$ (E) -1



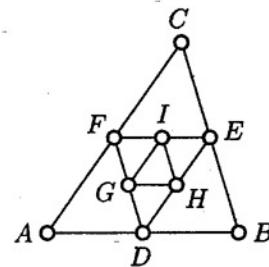
- (27) In the figure, the circle has center O and radius r . Also $OA = AB$ and $CD \perp AB$. Find the area of the shaded region.

- (A) $\frac{r^2}{2}$ (B) $\frac{3r^2}{4}$ (C) $\frac{\pi r^2}{2}$ (D) $\frac{\pi r^2}{4}$ (E) r^2



- (28) In the diagram D , E , and F are midpoints of \overline{AB} , \overline{BC} , and \overline{CA} . Also G , H , and I are midpoints of \overline{FD} , \overline{DE} , and \overline{FE} , respectively. If the area of $\triangle GHI$ is 12, what is the area of $\triangle ABC$?

- (A) 154 (B) 180 (C) 144 (D) 192 (E) 384



- (29) A sphere is inscribed in a right circular cylinder. The radius of the sphere is r . The ratio of the volume of the sphere to the volume of the cylinder is:
- (A) 2 : 3 (B) 4 : 9 (C) $2\pi : 6r$ (D) $4 : 2\pi$ (E) $1 : r$
- (30) How many planes of symmetry does a cube have?
- (A) 3 (B) 6 (C) 8 (D) 9
- (31) Find the ratio of the area of the circle circumscribing a regular hexagon to the area of the circle inscribed in the same hexagon.
- (A) 2 : 1 (B) $2 : \pi$ (C) 3 : 2 (D) 4 : 3 (E) 6 : 5