15 The endpoints of one side of a regular pentagon are (-1,4) and (2,3). What is the perimeter of the pentagon?

Use this space for computations.

- (1) $\sqrt{10}$ (3) $5\sqrt{2}$
- (2) $5\sqrt{10}$ (4) $25\sqrt{2}$
- **16** In the diagram of right triangle *ABC* shown below, AB = 14 and AC = 9.



What is the measure of $\angle A$, to the *nearest degree*?

- (1) 33 (3) 50
- (2) 40 (4) 57
- 17 What are the coordinates of the center and length of the radius of the circle whose equation is $x^2 + 6x + y^2 4y = 23$?
 - (1) (3,-2) and 36 (3) (-3,2) and 36
 - (2) (3,-2) and 6 (4) (-3,2) and 6
- **18** The coordinates of the vertices of $\triangle RST$ are R(-2,-3), S(8,2), and T(4,5). Which type of triangle is $\triangle RST$?
 - (1) right (3) obtuse
 - (2) acute (4) equiangular

19 Molly wishes to make a lawn ornament in the form of a solid sphere. The clay being used to make the sphere weighs .075 pound per cubic inch. If the sphere's radius is 4 inches, what is the weight of the sphere, to the *nearest pound*?

- (1) 34 (3) 15
- (2) 20 (4) 4

20 The ratio of similarity of $\triangle BOY$ to $\triangle GRL$ is 1:2. If BO = x + 3 and GR = 3x - 1, then the length of \overline{GR} is

- (1) 5 (3) 10
- (2) 7 (4) 20
- **21** In the diagram below, \overline{DC} , \overline{AC} , \overline{DOB} , \overline{CB} , and \overline{AB} are chords of circle O, \overline{FDE} is tangent at point D, and radius \overline{AO} is drawn. Sam decides to apply this theorem to the diagram: "An angle inscribed in a semi-circle is a right angle."



Which angle is Sam referring to?

- (1) $\angle AOB$ (3) $\angle DCB$
- $(2) \ \angle BAC \qquad \qquad (4) \ \angle FDB$

- Use this space for computations.
- **22** In the diagram below, \overline{CD} is the altitude drawn to the hypotenuse \overline{AB} of right triangle ABC.



Which lengths would *not* produce an altitude that measures $6\sqrt{2}$?

- (1) AD = 2 and DB = 36 (3) AD = 6 and DB = 12
- (2) AD = 3 and AB = 24 (4) AD = 8 and AB = 17
- **23** A designer needs to create perfectly circular necklaces. The necklaces each need to have a radius of 10 cm. What is the largest number of necklaces that can be made from 1000 cm of wire?
 - (1) 15 (3) 31
 - (2) 16 (4) 32
- **24** In $\triangle SCU$ shown below, points T and O are on \overline{SU} and \overline{CU} , respectively. Segment OT is drawn so that $\angle C \cong \angle OTU$.



(2) 8.75 (4) 15

Part II

Answer all 7 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [14]

25 Triangle *ABC* is graphed on the set of axes below. Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection over the line x = 1.

