

**NEW YORK STATE
COMPONENT RETEST**

**MATHEMATICS A
COMPONENT 4
MODULE 1**

WEDNESDAY, APRIL 24, 2002

**SCORING KEY
AND
RATING GUIDE
CORRECTED EDITION**

Multiple Choice Key

1	1
2	2
3	2
4	1
5	3
6	2

COMPONENT 4
MODULE 1

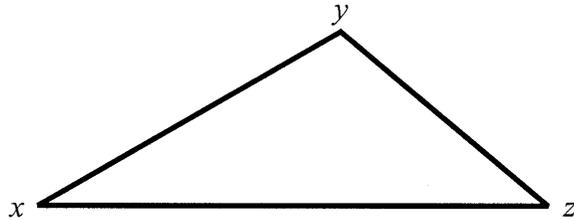
QUESTION 7

TRAINING SET

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

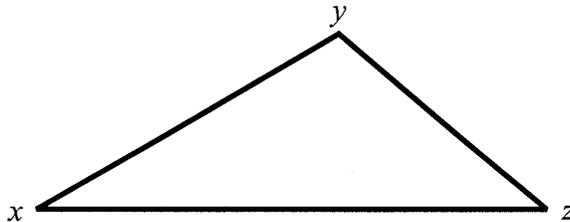
- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



Sample Response:

$$x + x + 80 + x + 10 = 180$$

$$3x + 90 = 180$$

$$3x = 90$$

$$x = 30$$

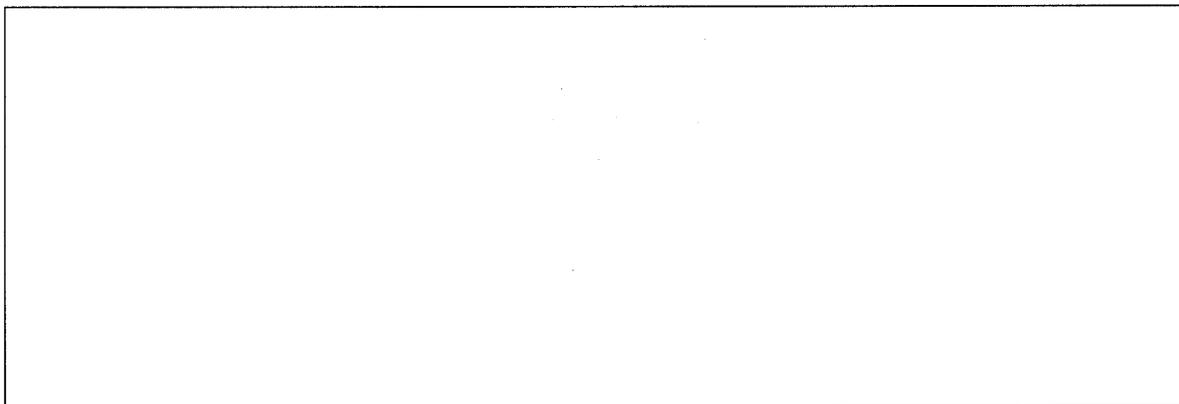
$$y = 30 + 80 = 110$$

$$z = 30 + 10 = 40$$

$$m\angle x = 30 \text{ or } 30^\circ$$

$$m\angle y = 110 \text{ or } 110^\circ$$

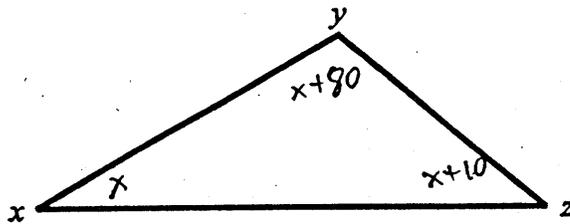
$$m\angle z = 40 \text{ or } 40^\circ$$



Rubric

- [4] $m\angle x = 30$, $m\angle y = 110$, $m\angle z = 40$, and appropriate work is shown.
- [3] Appropriate work is shown, but one computational error is made.
or
- [3] An appropriate equation is set up and solved correctly for x , but no further work is shown.
- [2] Appropriate work is shown, but more than one computational error is made.
or
- [2] Appropriate work is shown, but a conceptual error is made, such as setting the sum of the three angles equal to 360° , but three appropriate angles are determined.
or
- [2] All three angles are defined in terms of the smallest angle, but no equation is given but all three angles are found correctly.
or
- [2] Correct answers are given, but support is incomplete [e.g., paper #3]
- [1] All three angles are defined in terms of the smallest angle, but no equation is set up and no answers are given or partially correct answers are given (that is, of the same level of difficulty).
or
- [1] An incorrect but equivalent equation is set up and solved correctly, but no further work is shown.
or
- [1] $m\angle x = 30$, $m\angle y = 110$, $m\angle z = 40$, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$x + x + 80 + x + 10 = 180$$

$$3x + 90 = 180$$

$$-90 \quad -90$$

$$3x = 90$$

$$x = 30$$

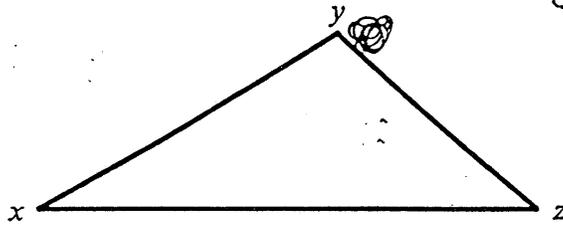
$$\text{Angle } x = 30^\circ$$

$$\text{Angle } y = 110^\circ$$

$$\text{Angle } z = 40^\circ$$

SCORE POINT: 4

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$y = 80^\circ + x$$

$$z = 10^\circ + x$$

$$180^\circ = x + 80^\circ + x + 10^\circ + x$$

$$180^\circ = 3x + 90^\circ$$

-90

-90

$$\frac{90^\circ}{3} = \frac{3x}{3}$$

$$30^\circ = x$$

ans.

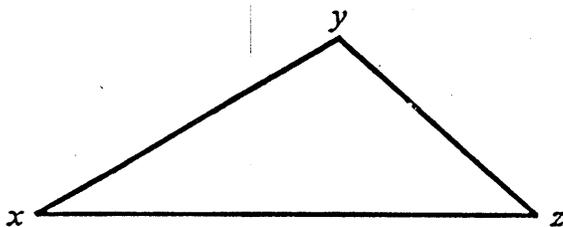
$$x = 30^\circ$$

$$y = 110^\circ$$

$$z = 40^\circ$$

SCORE POINT: 4

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$\begin{aligned}
 y &= x + 80 \\
 z &= x + 10 \\
 x + 80 + x + 10 + x &= 180 \\
 3x + 90 &= 180 \\
 x &= \frac{180 - 90}{3} = 33 = x \\
 x + 80 &= 33 + 80 = 113 = y \\
 x + 10 &= 33 + 10 = 43 = z \\
 \text{CHECK } 33 + 113 + 43 &= 180
 \end{aligned}$$

SCORE POINT: 3

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?

$$x + x + 80 + x + 10 = 180$$

$$2x + 90 = 180$$

$$x = 45$$

$$180 - 90 = 90$$

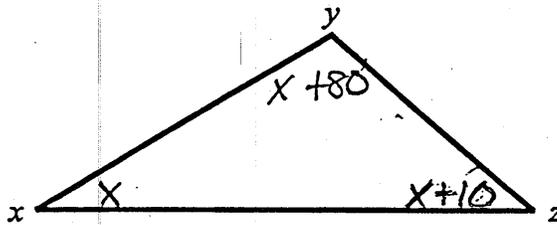
$$\frac{90}{2} = 45$$

$$y = x + 80 = 115$$

$$z = x + 10 = 55$$

SCORE POINT: 2

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$\begin{array}{r} 3x + 90 = 360 \\ - 90 \quad - 90 \\ \hline 3x \qquad 270 \\ \hline x \qquad 90 \end{array}$$

$$x = 90$$

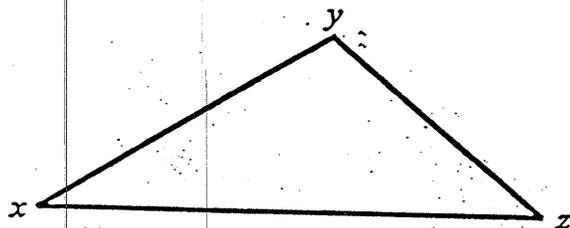
$$x = \underline{90}$$

$$y = (90) + 80 = \underline{170}$$

$$z = (90) + 10 = \underline{100}$$

SCORE POINT: 2

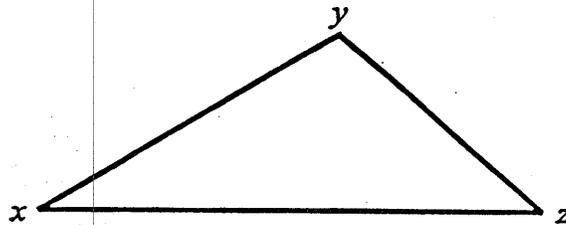
- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$\begin{aligned}x + 80 + x + 10 &= 180 \\2x + 90 &= 180 \\x &= \frac{180 - 90}{2} \\&= 45\end{aligned}$$

SCORE POINT: 1

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



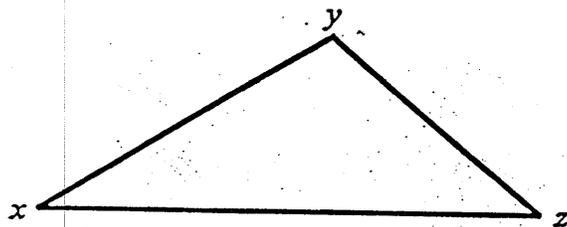
y is 80 more $\rightarrow y = x + 80$

z is 10 more $\rightarrow z = x + 10$

SMALLEST $\rightarrow x = x$

SCORE POINT: 1

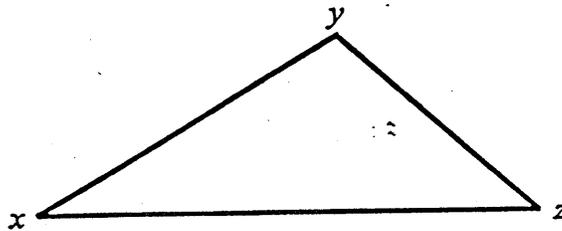
- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$x + y + z = 80 - 10$$

Score Point: 0

- 7 In the accompanying diagram of $\triangle xyz$, the measure of the largest angle, y , is 80° more than the measure of the smallest angle, x . The measure of the remaining angle, z , is 10° more than the measure of the smallest angle. What are the measures of each of the angles of the triangle?



$$x + y + z = 90$$

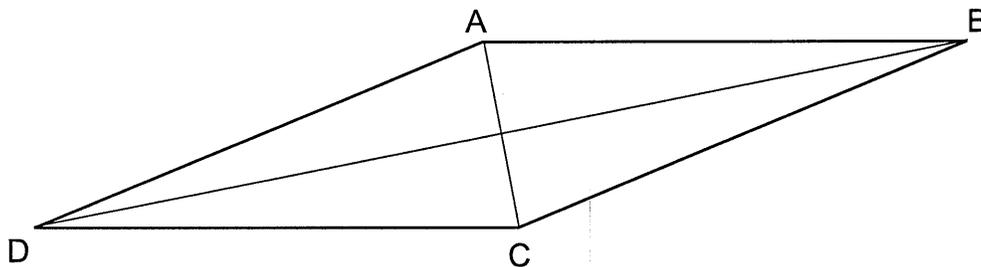
Score Point: 0

COMPONENT 4
MODULE 1

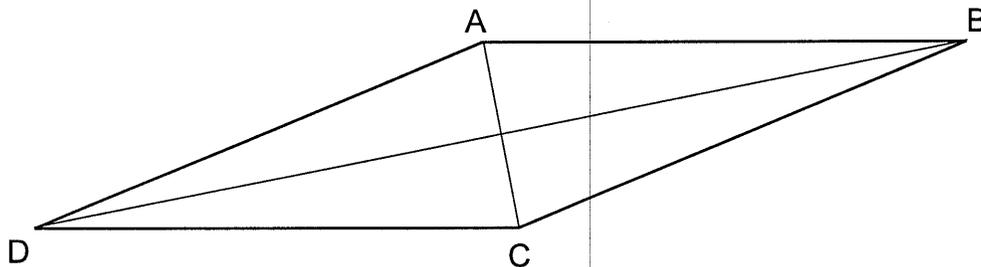
QUESTION 8

TRAINING SET

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



Sample Response:

$$s = \sqrt{7^2 + 24^2} = 25$$

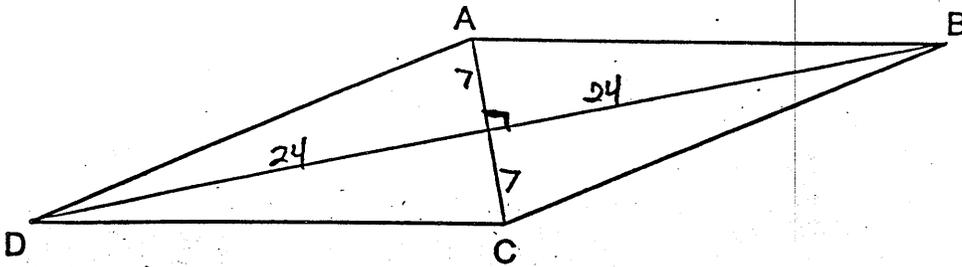
$$4 \times 25 = 100$$

--	--

Rubric

- [4] 100, and appropriate work is shown, such as the method shown in the sample response.
- [3] Appropriate work is shown, but one computational error is made.
or
- [3] Appropriate work is shown, and the side is determined to be 25, but the perimeter is not determined or is determined incorrectly.
- [2] Appropriate work is shown, but more than one computational error is made.
or
- [2] A conceptual error is made, such as substituting 14 and 48 into the Pythagorean theorem, but an appropriate perimeter is determined.
- [1] Side length of 50 is found, but no perimeter is determined.
or
- [1] 100, but no work is shown.
or
- [1] An incorrect procedure is used, but it is shown that the diagonals of the rhombus bisect. [paper #2]
- [0] The Pythagorean theorem is stated, but no further work is shown.
or
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$P = 4 \overline{AB}$$

$$P = 100 \text{ in}$$

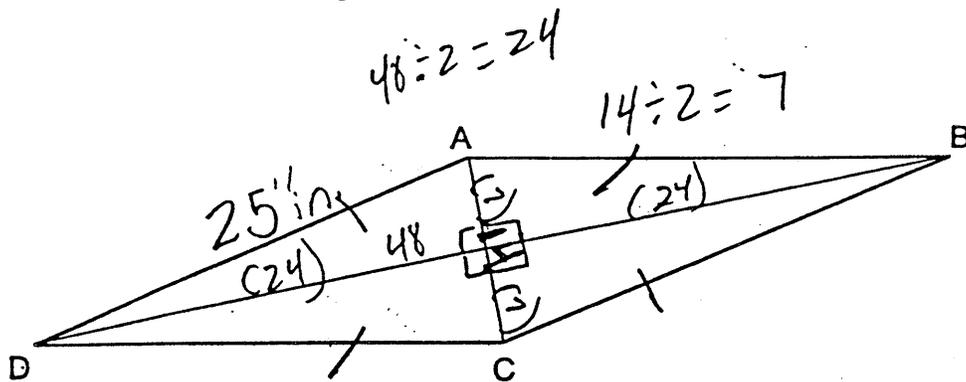
$$7^2 + 24^2 = AB^2$$

$$625 = AB^2$$

$$25 = AB$$

SCORE POINT: 4

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$a^2 + b^2 = c^2$$

$$7^2 + 24^2 = c^2$$

$$49 + 576 = c^2$$

$$\sqrt{625} = \sqrt{c^2}$$

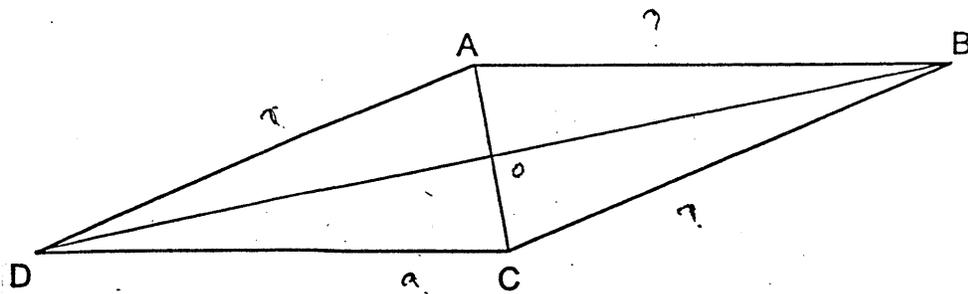
$$c = 25$$

$$25'' \times 4 =$$

$$100 \text{ inches}$$

SCORE POINT: 4

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



Let diagonal $BD = 48$ inches

Diagonal $AC = 14$ inches

As we know,

In rhombus diagonals bisect each other ~~at~~ perpendicular

$$AC = AO + OC = 7 + 7 \text{ inches}$$

$$BD = BO + OD = 24 + 24 \text{ inches}$$

(Central point is O)

Consider ^{right} $\triangle BOC$.

$$OB^2 + OC^2 = BC^2$$

$$24^2 + 7^2 = BC^2$$

$$676 = BC^2$$

$$\sqrt{676} = BC$$

$$BC = 26 \text{ inches}$$

Since perimeter of rhombus is represent

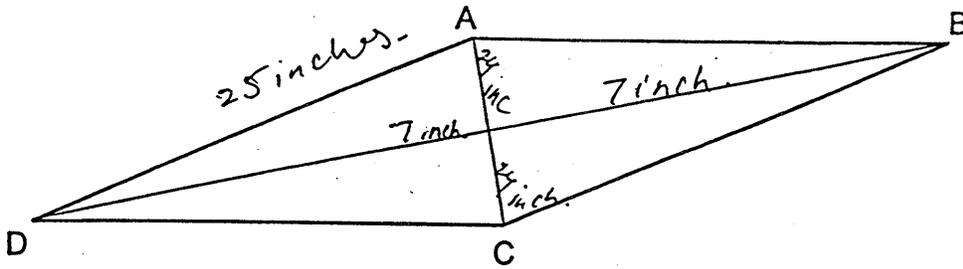
$$\rightarrow 4a$$

$$4 \times 26 = 104 \text{ inches}$$

perimeter

SCORE POINT: 3

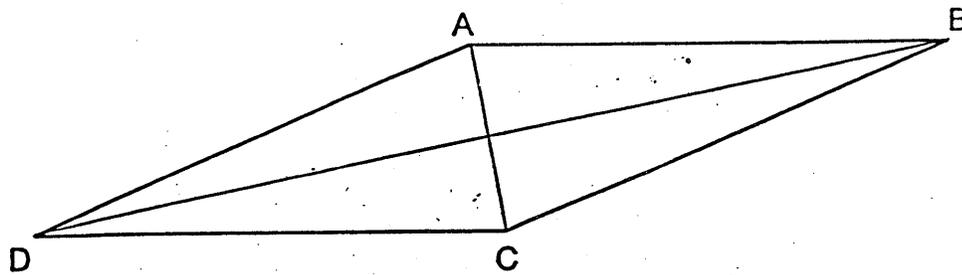
- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 (7)^2 + (24)^2 &= c^2 \\
 49 + 576 &= c^2 \\
 625 &= c^2 \\
 c &= \sqrt{625} \\
 \boxed{c = 25 \text{ inches}}
 \end{aligned}$$

SCORE POINT: 3

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are, 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$\frac{14}{2} = 7 \quad \text{AND} \quad \frac{48}{2} = 23$$

$$7^2 + 23^2 = s^2$$

$$49 + 529 = s^2$$

$$578 = s^2$$

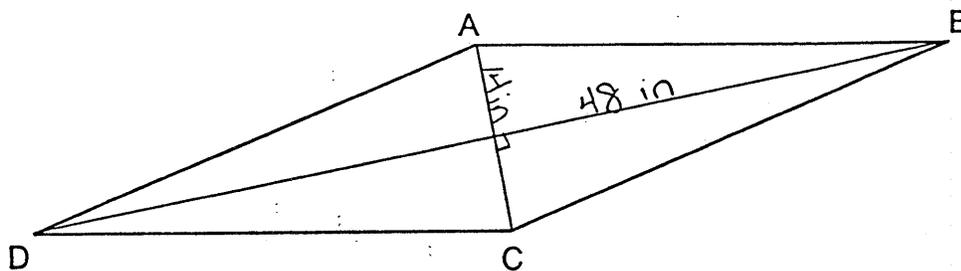
$$\sqrt{578} = s$$

$$s = 24.4$$

$$s + s + s + s = 24.4 + 24.4 + 24.4 + 24.4 = 97.6$$

SCORE POINT: 2

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$\begin{aligned}
 14^2 + 48^2 &= \overline{AB}^2 \\
 196 + 2304 &= \overline{AB}^2 \\
 \sqrt{2500} &= \sqrt{\overline{AB}^2} \\
 50 &= \overline{AB}
 \end{aligned}$$

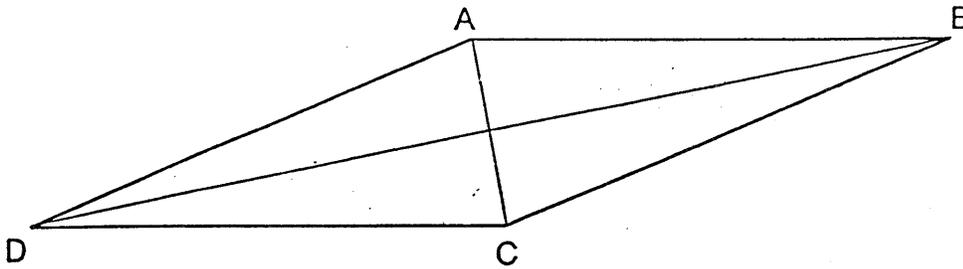
$$P = 4s$$

$$P = 4(50)$$

$$P = 200 \text{ in}$$

SCORE POINT: 2

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?

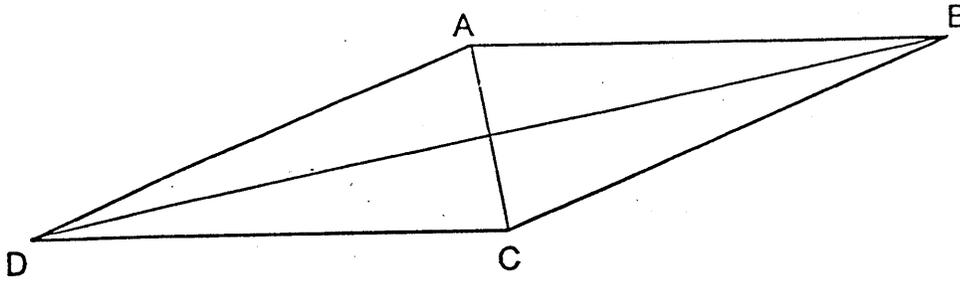


$$14^2 + 48^2 = 2500$$

$$\sqrt{2500} = 50$$

SCORE POINT: 1

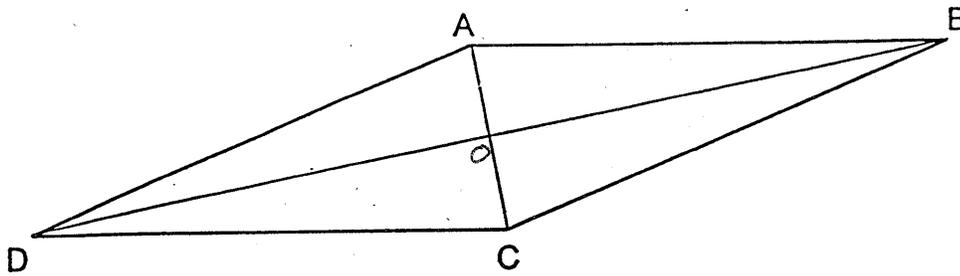
- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



Perimeter is 100

SCORE POINT: 1

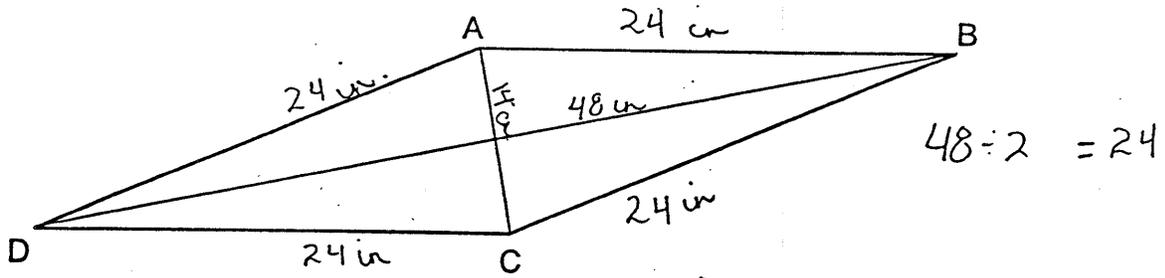
- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$\overline{AO}^2 + \overline{OB}^2 = \overline{AB}^2$$

Score Point: 0

- 8 The diagonals of rhombus $ABCD$ shown in the accompanying diagram are 14 inches and 48 inches. What is the perimeter of the rhombus, in inches?



$$\begin{aligned} \text{Perimeter} &= S + S + S + S \\ &= 24 + 24 + 24 + 24 \\ &= 96 \text{ in.} \end{aligned}$$

$$\text{Perimeter} = 96 \text{ inches}$$

Score Point: 0

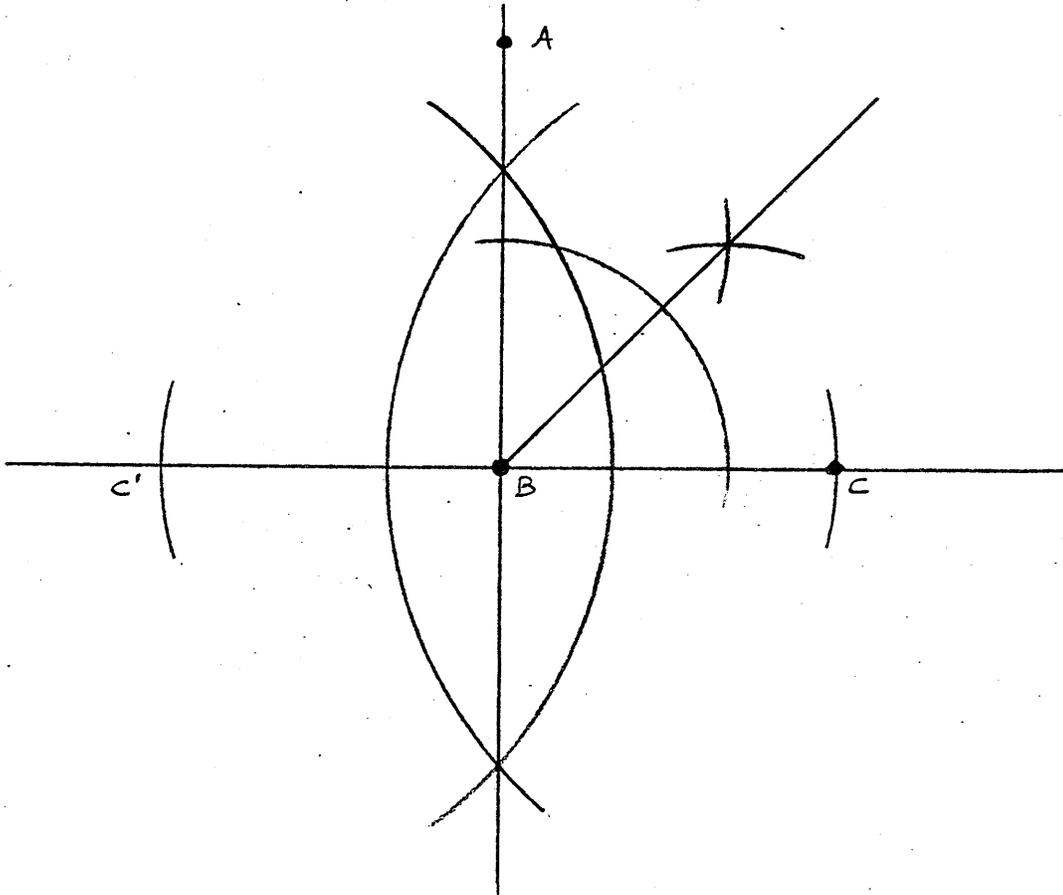
COMPONENT 4
MODULE 1

QUESTION 9

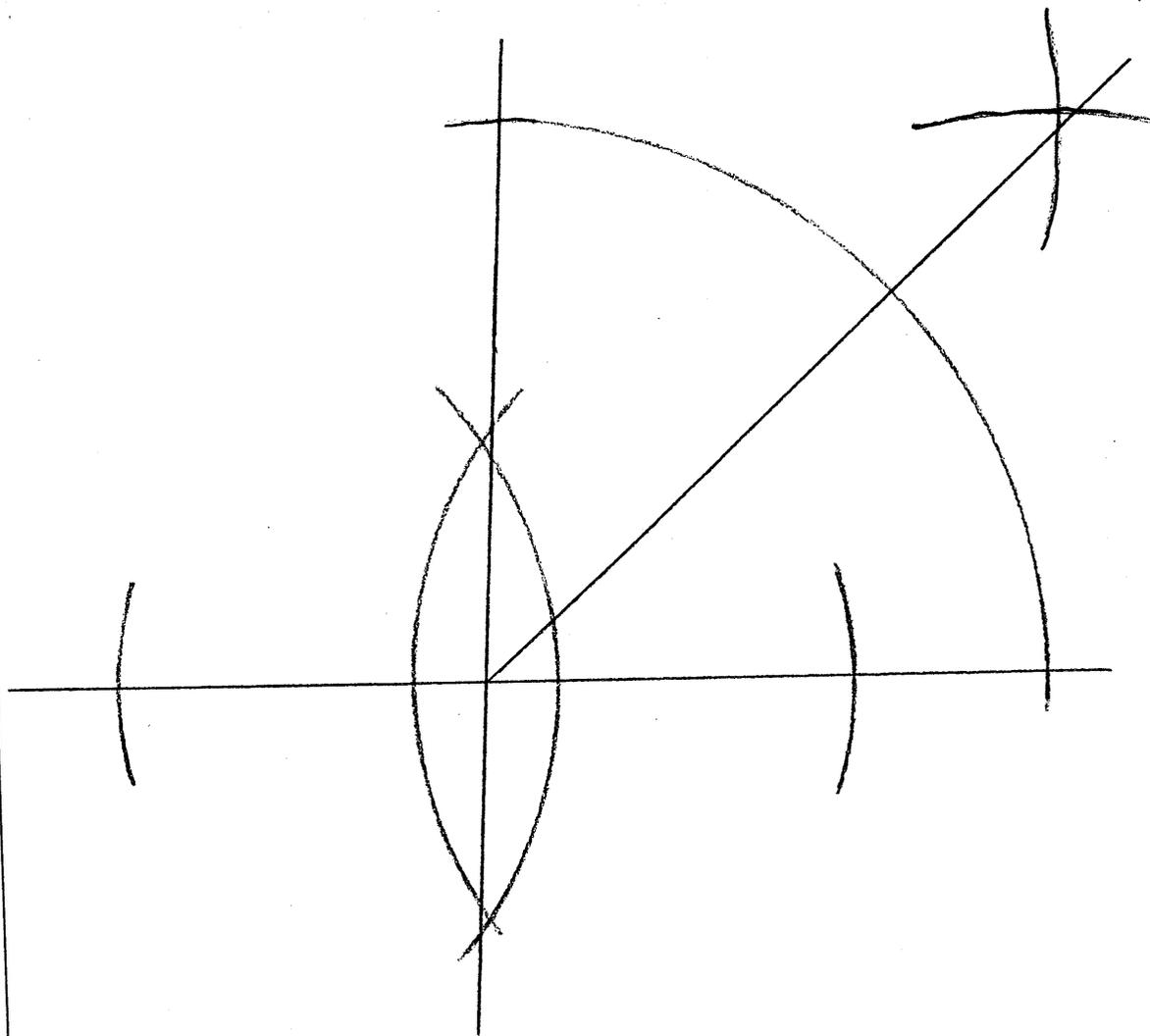
TRAINING SET

- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.

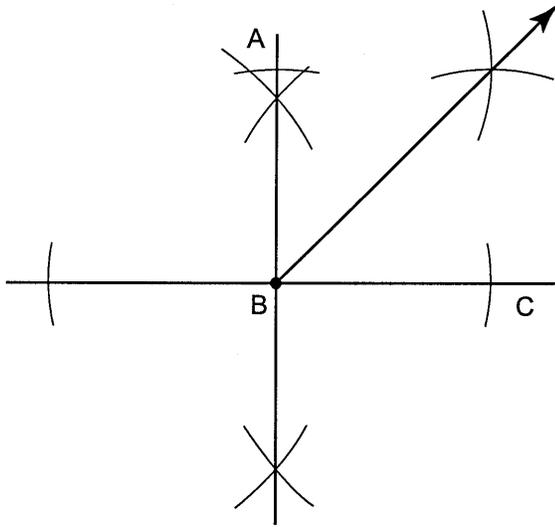
- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



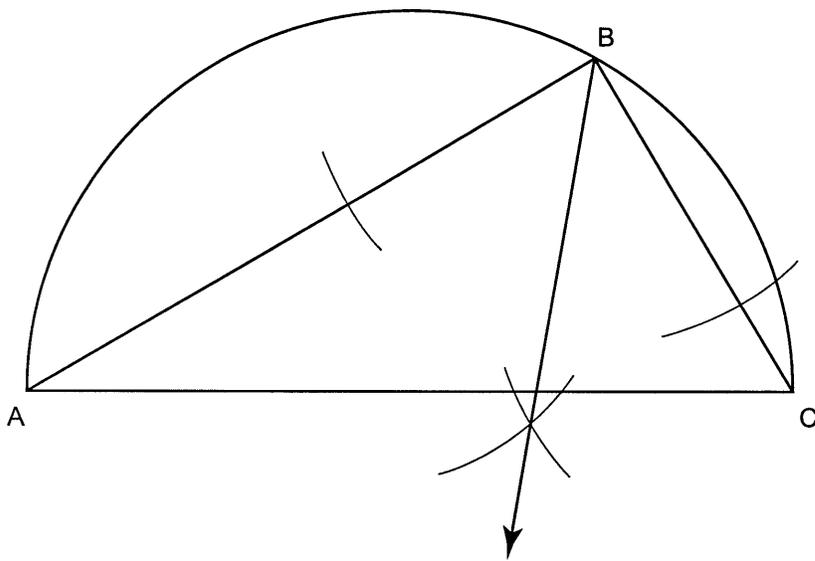
- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



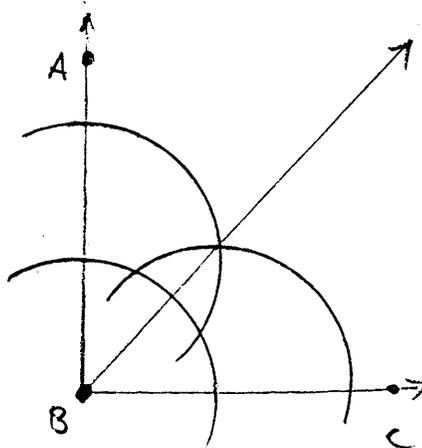
OR



Rubric:

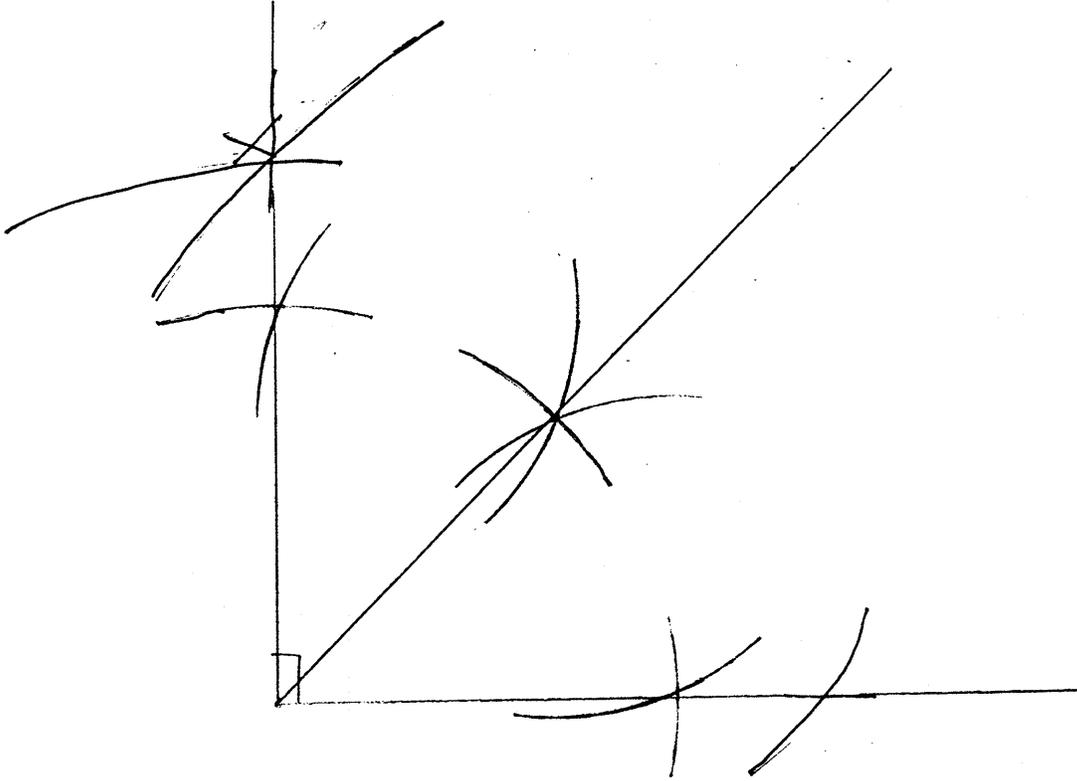
- [4] Correct figures and appropriate hash marks are shown, such as the ones in the sample response.
- [3] One construction error is made, but all further work is appropriate.
- [2] More than one construction error is made, but appropriate hash marks are shown for the construction.
or
- [2] One conceptual error is made, but appropriate hash marks are shown for the construction.
or
- [2] Right angle is constructed and labeled correctly, or angle is bisected correctly with appropriate hash marks shown.
- [1] Incorrect figures are shown, errors in the construction are made, but some correct work is shown.
- [0] Correct figures but no hash marks, or only incorrect hash marks are shown.
or
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



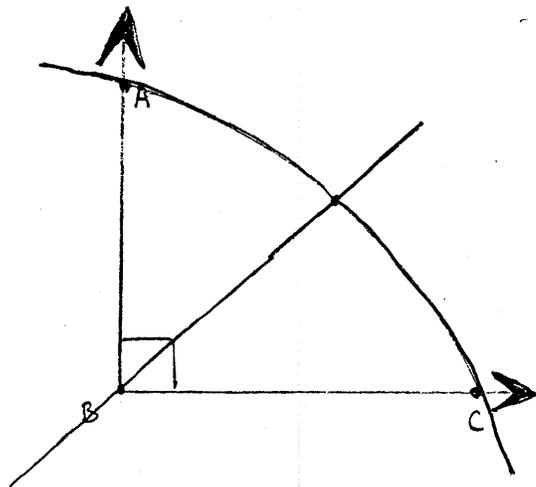
SCORE POINT: 2

- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



SCORE POINT: 1

- 9 Using your compass and a straightedge, construct a right angle and label it ABC . Bisect $\angle ABC$. Show all hash marks.



Score Point: 0