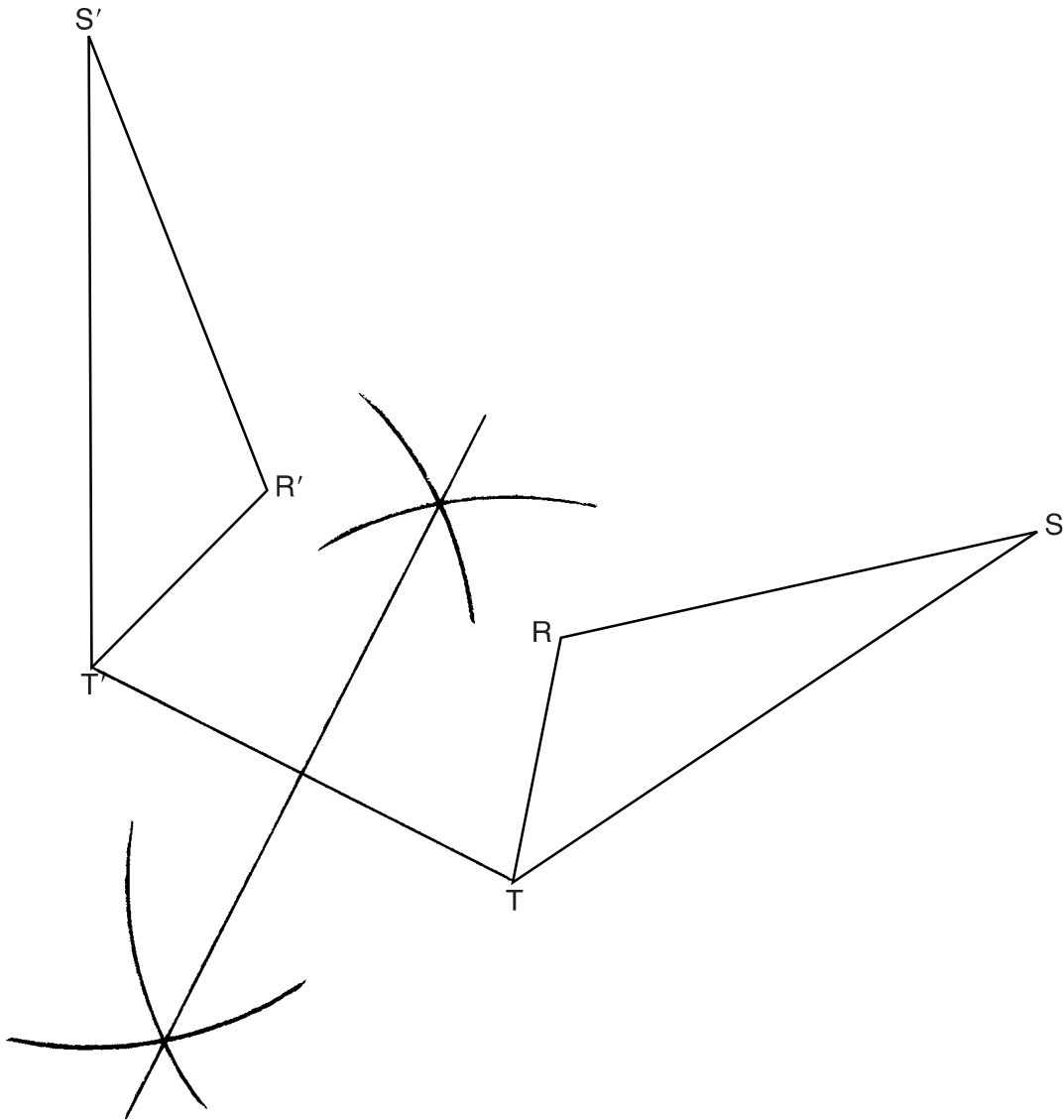


**Question 25**

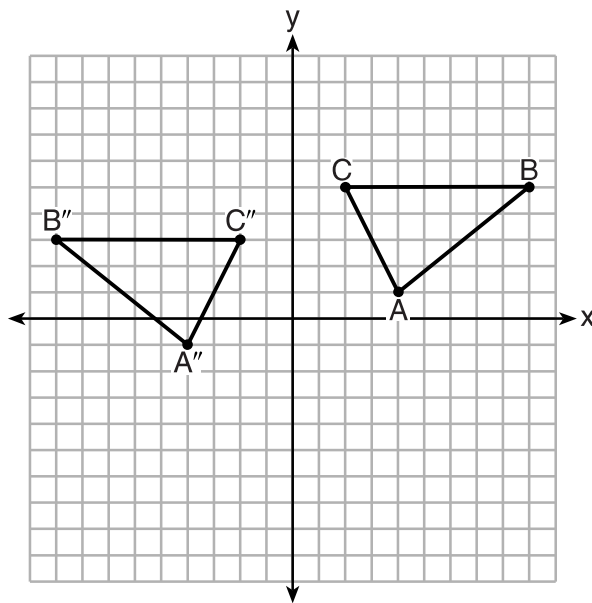
**25** Using a compass and straightedge, construct the line of reflection over which triangle  $RST$  reflects onto triangle  $R'S'T'$ . [Leave all construction marks.]



**Score 2:** The student had a complete and correct response.

**Question 26**

26 The graph below shows  $\triangle ABC$  and its image,  $\triangle A''B''C''$ .



Describe a sequence of rigid motions which would map  $\triangle ABC$  onto  $\triangle A''B''C''$ .

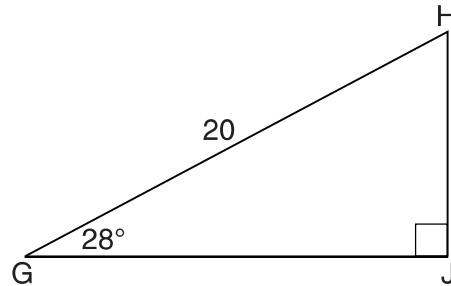
Translate  $\triangle ABC$  left 4 units and down 2 units followed by a reflection over line  $x = -2$

**Score 2:** The student had a complete and correct response.

**Question 27**

27 When instructed to find the length of  $\overline{HJ}$  in right triangle  $HJG$ , Alex wrote the equation  $\sin 28^\circ = \frac{HJ}{20}$  while Marlene wrote  $\cos 62^\circ = \frac{HJ}{20}$ . Are both students' equations correct?

Explain why.

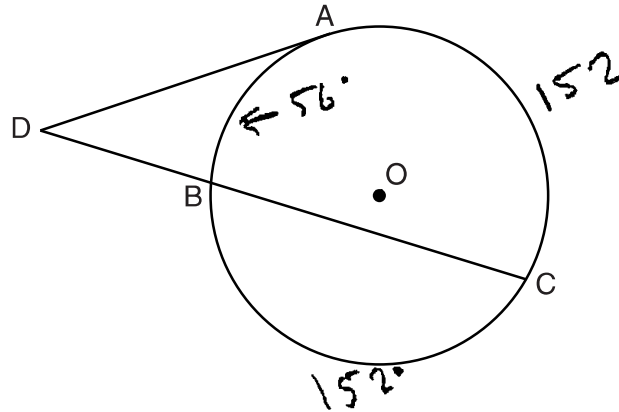


Yes, b/c  $28^\circ$  and  $62^\circ$  are acute angles and complementary angles. Since the sin of an angle equals the cos of its complement, both equations are correct.

**Score 2:** The student had a complete and correct response.

**Question 28**

**28** In the diagram below, tangent  $\overline{DA}$  and secant  $\overline{DBC}$  are drawn to circle  $O$  from external point  $D$ , such that  $\widehat{AC} \cong \widehat{BC}$ .



If  $m\widehat{BC} = 152^\circ$ , determine and state  $m\angle D$ .

$$360 - 152 - 152 = 56$$

$$152 - 56 = 96$$

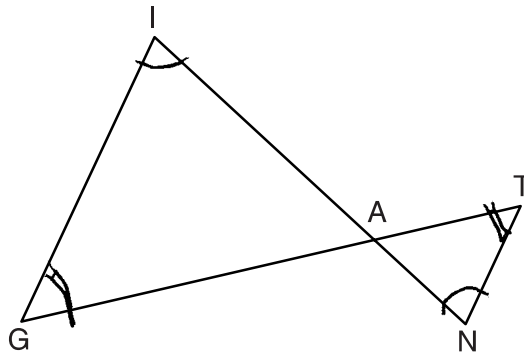
$$96 / 2 = 48$$

$m\angle D = 48^\circ$

**Score 2:** The student had a complete and correct response.

Question 29

29 In the diagram below,  $\overline{GI}$  is parallel to  $\overline{NT}$ , and  $\overline{IN}$  intersects  $\overline{GT}$  at A.



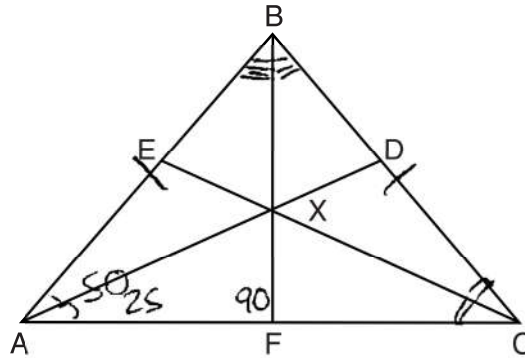
Prove:  $\triangle GIA \sim \triangle TNA$

$\overline{GI} \parallel \overline{NT}$ ,  $\overline{IN}$  intersects  $\overline{GT}$  at A  
(Given)  
↓  
 $\angle I \cong \angle N$ ,  $\angle G \cong \angle T$   
(// lines cut by a transversal  
makes  $\cong$  alt. int.  $\angle$ s)  
↓  
 $\triangle GIA \sim \triangle TNA$   
(AA)

Score 2: The student had a complete and correct response.

**Question 30**

30 In the diagram below of isosceles triangle  $ABC$ ,  $\overline{AB} \cong \overline{CB}$  and angle bisectors  $\overline{AD}$ ,  $\overline{BF}$ , and  $\overline{CE}$  are drawn and intersect at  $X$ .



If  $m\angle BAC = 50^\circ$ , find  $m\angle AXC$ .

$$\begin{array}{r}
 90 \\
 + 25 \\
 \hline
 \textcircled{115}
 \end{array}$$
  

$$\begin{array}{r}
 180 \\
 - 115 \\
 \hline
 \textcircled{65 \times 2}
 \end{array}$$
  

$$\textcircled{m\angle AXC = 130^\circ}$$

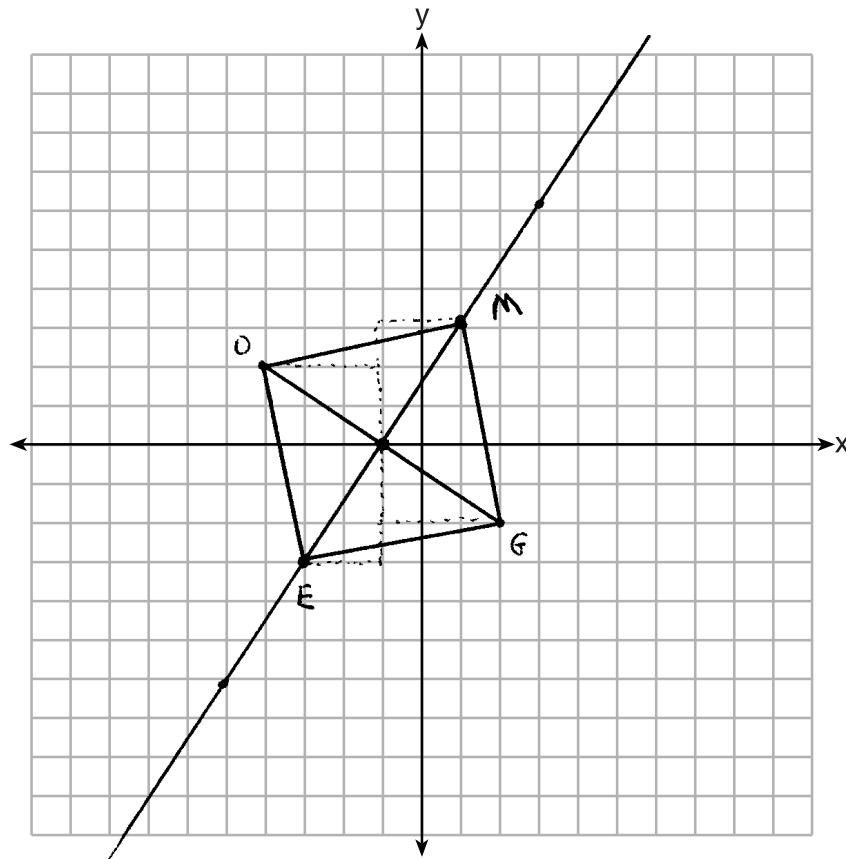
**Score 2:** The student had a complete and correct response.

**Question 31**

**31** In square  $GEOM$ , the coordinates of  $G$  are  $(2, -2)$  and the coordinates of  $O$  are  $(-4, 2)$ . Determine and state the coordinates of vertices  $E$  and  $M$ .

[The use of the set of axes below is optional.]

$M(1, 3)$   
 $E(-3, -3)$



$$\overline{GO} \rightarrow \frac{-4}{2} = -\frac{2}{1}$$
$$\perp \rightarrow \frac{6}{4} = \frac{3}{2}$$

**Score 2:** The student had a complete and correct response.