

**Geometry**  
**Final Exam Review**

Name: Key  
Date: \_\_\_\_\_ Block: \_\_\_\_\_

**The Final**

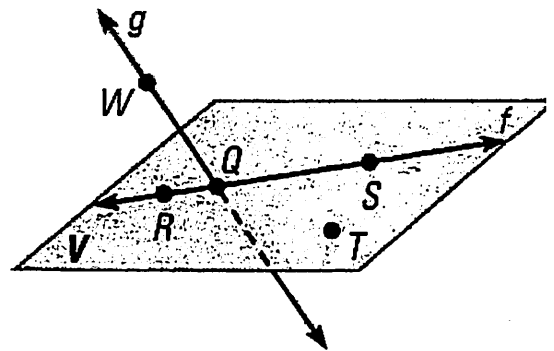
Multiple Choice – 40 questions, 1.5 points each

Short Answer – 10 questions, 2 points each

Open Ended – 5 questions, 4 points each

**1. Use the diagram to answer the following.**

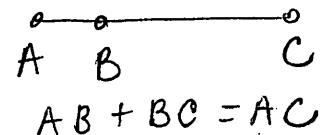
- a) Name a pair of opposite rays.  $\overrightarrow{QR}$ ,  $\overrightarrow{QS}$
- b) Name the intersection of line  $f$  and  $\overleftrightarrow{WQ}$ .  $Q$
- c) Give another name for  $\overrightarrow{RQ}$ .  $\overrightarrow{RS}$
- d) Give two other names for plane  $V$ .  $RQT$ ,  $RST$
- e) Give two other names for  $\overrightarrow{RQ}$ . line  $f$ ,  $\overleftrightarrow{SR}$
- f) Name two segments in the diagram.  $\overline{WQ}$ ,  $\overline{RS}$
- g) Name the intersection of line  $f$  and plane  $V$ . line  $f$  (all points on the line are common to both)



**2. Point B is between A and C on  $\overline{AC}$ . Draw a diagram and solve for  $x$  and each segment.**

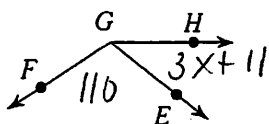
a)  $AC = 3x + 3$   $AC = 24$   
 $AB = -1 + 2x$   $AB = 13$   
 $BC = 11$   
 $AB + BC = AC$   
 $-1 + 2x + 11 = 3x + 3$   
 $2x + 10 = 3x + 3$   
 $7 = x$

b)  $AC = 22$   
 $BC = x + 14$   $BC = 13$   
 $AB = x + 10$   $AB = 9$   
 $22 = x + 10 + x + 14$   
 $22 = 2x + 24$   
 $-2 = 2x$   
 $x = -1$



**3. Use the diagram to find the value of  $x$ .**

$m\angle HGF = 16x + 4$ ,  $m\angle EGF = 110^\circ$ ,  
and  $m\angle HGE = 3x + 11$ . Find  $x$ .



$110 + 3x + 11 = 16x + 4$   
 $121 + 3x = 16x + 4$   
 $117 = 13x$   
 $x = 9$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

4. Find the length of  $\overline{DC}$ . Round to the nearest tenth.

a)  $D(6,7)$  and  $C(-2,1)$

b)  $D(-1,6)$  and  $C(-8,-4)$

$$d = \sqrt{(6 - (-2))^2 + (7 - 1)^2}$$

$$d = \sqrt{64 + 36}$$

$$d = \sqrt{100}$$

$$d = 10 \quad \text{DC} = 10$$

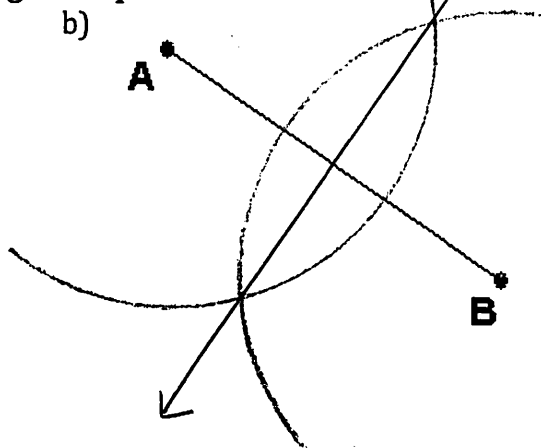
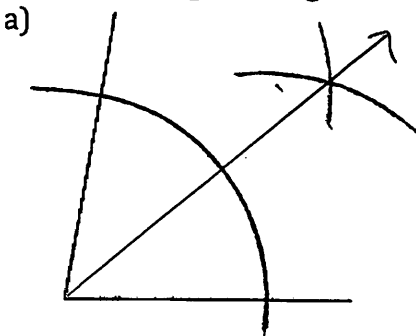
$$d = \sqrt{(-1 + 8)^2 + (6 - (-4))^2}$$

$$d = \sqrt{49 + 100}$$

$$d = 12.2$$

$$\text{DC} = 12.2$$

5. Bisect the given segment and angle using a compass.



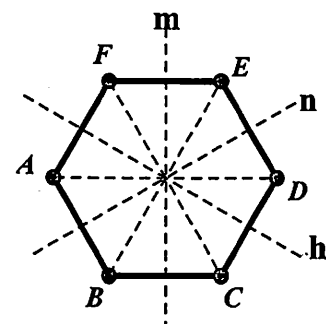
6. Using the diagram below, determine the name of the point that meets the given condition:

a)  $R_m(A) = \underline{D}$

b)  $R_h(F) = \underline{A}$

c)  $R_n(E) = \underline{D}$

d)  $R_h(\underline{D}) = C$



7. Isometric transformations.

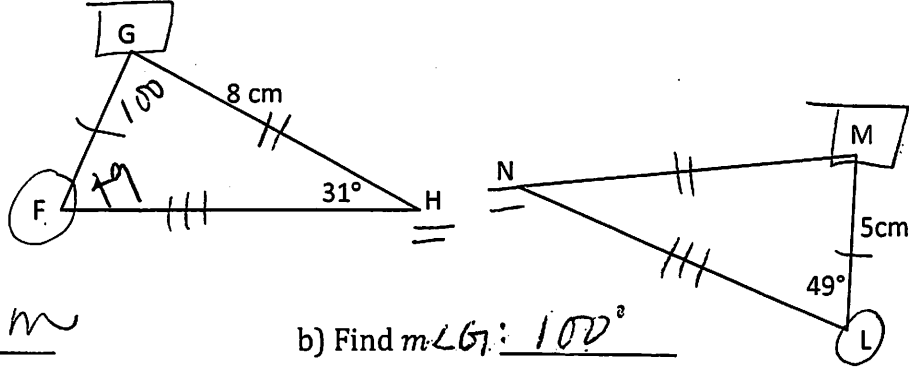
- a) What is an isometric transformation? *image is congruent to pre-image*
- b) What types of transformations are isometric? *reflection, rotation, translation*
- c) What type of transformations are not isometric? *dilation*
- d) Given the translation rule  $T(x,y) \rightarrow (x-1, y-2)$  and  $A(-3,6)$ , find  $A'$ . Is this transformation an isometry?

*yes, same size different location*

$$A'(-3-1, 6-2)$$

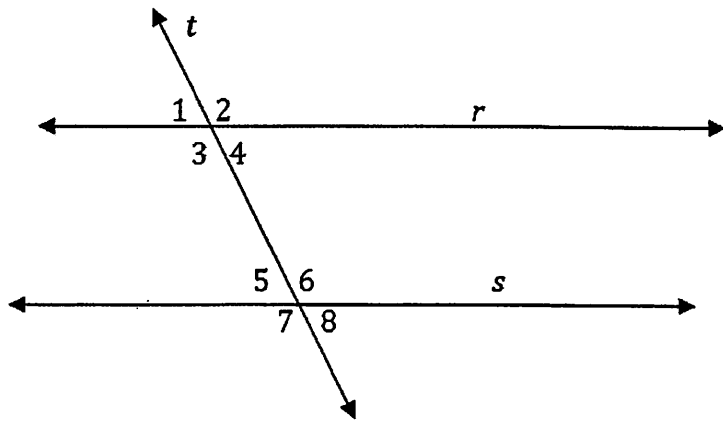
$$A'(-4, 4)$$

8. In the diagram,  $\triangle FGH \cong \triangle LMN$



a) Find GF: 5 cm

b) Find  $m\angle G$ :  $100^\circ$



9. Use the diagram above to answer the questions. Assume  $r \parallel s$ .

a) Name a pair of alternate interior angles:  $\angle 3 + \angle 6$ ,  $\angle 4 + \angle 5$

b) Name a pair of vertical angles:  $\angle 2 + \angle 3$ ,  $\angle 1 + \angle 4$ ,  $\angle 5 + \angle 8$ ,  $\angle 6 + \angle 7$

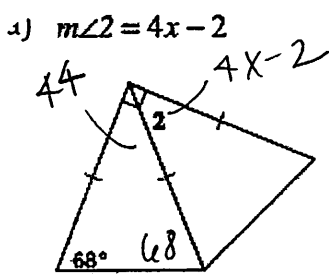
c) If  $m\angle 1 = 102$ , find  $m\angle 8$ : 102 <sup>AE</sup>

d) If  $m\angle 6 = 113$ , find  $m\angle 4$ : 67 <sup>CI</sup>

e) If  $m\angle 3 = 84$ , find  $m\angle 7$ : 84 <sup>corr</sup>

e) If  $m\angle 5 = 103$ , find  $m\angle 8$ : 103 <sup>v</sup>

10. Find x.

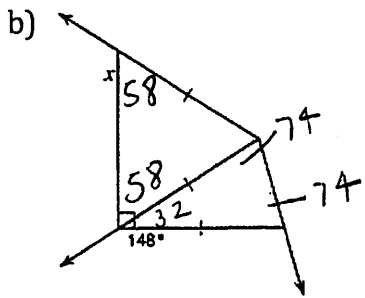


$$44 + 4x - 2 = 90$$

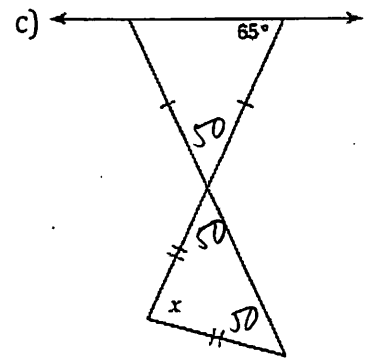
$$4x + 42 = 90$$

$$4x = 48$$

$$x = 12$$



$$x = 122$$

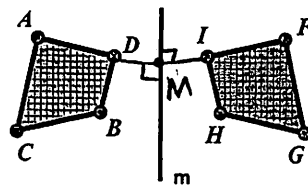


$$x = 80$$

11. Use the reflection shown to answer the following questions.

a) Is the transformation an isometry? If so, write a congruence statement.

↳ yes, reflection  $\triangle ABC \cong \triangle FIGH$

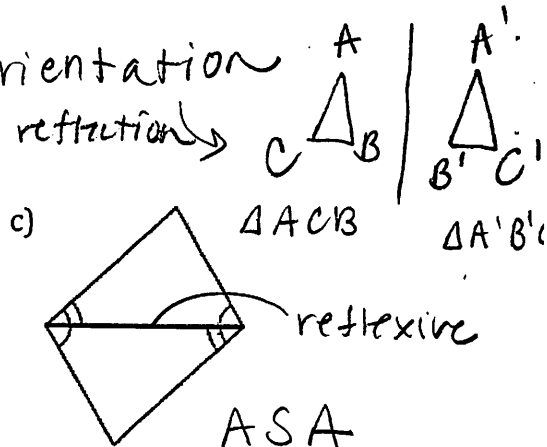
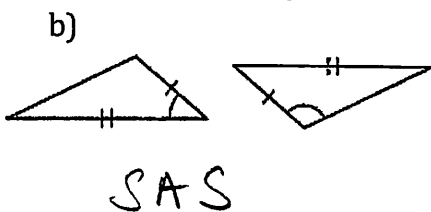
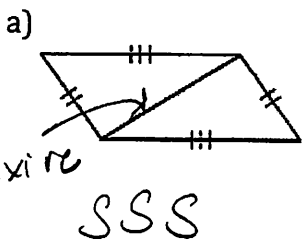


b) Place point M on the line of reflection such that  $\overline{DM} = \overline{IM}$  ✓

c) Does the orientation change? Explain.

yes, a reflection changes orientation  
order of letters changes after reflection

12. Are the triangles congruent? If yes, state how you know.



13. Use diagram below to answer the following questions.

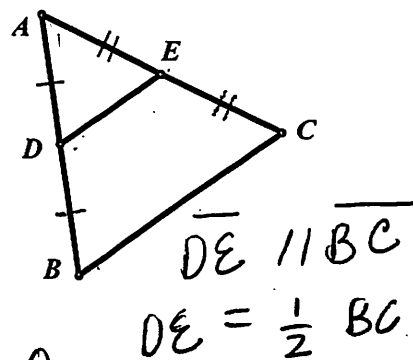
a) What type of segment is  $\overline{DE}$ ?  $\overline{DE}$  is a midsegment because  $\overline{DE}$  connects the midpoints of two sides of a triangle.

b) If the slope of DE is  $\frac{2}{3}$ , what is the slope of BC?  $\frac{2}{3}$

c) If the length of BC is 14, what is the length of DE? 7

d) If the measure of  $\angle ADE$  is 48, what is the measure of  $\angle ABC$ ? 48

e) If the measure of  $\angle ADE$  is 48, what is the measure of  $\angle BDE$ ? 132

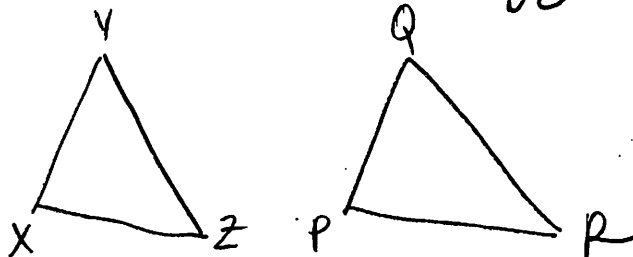


14. Given  $\triangle XYZ \sim \triangle PQR$ .

a) Draw a picture of the triangles. ✓

b) List congruent angles.

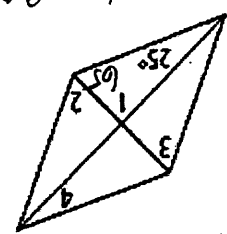
$\angle X \cong \angle P$   $\angle Z \cong \angle R$   
 $\angle Y \cong \angle Q$



c) Write a proportionality statement.

$$\frac{XY}{PQ} = \frac{YZ}{QR} = \frac{XZ}{PR}$$

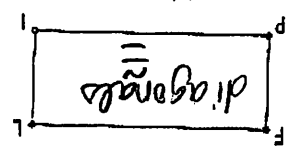
$m\angle 1 = 90^\circ$   
 $m\angle 4 = 25^\circ$   
 $m\angle 2 = 65^\circ$   
 $m\angle 3 = 65^\circ$



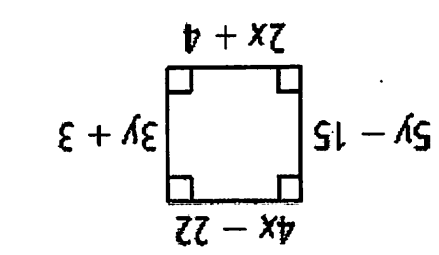
a) Rhombus

18. The type of figure is provided. Find the indicated values.

$2x = 3$   
 $x = \frac{3}{2}$



b) Rectangle  
 $LP = 4x - 2, PF = 13, FI = 2x + 1$



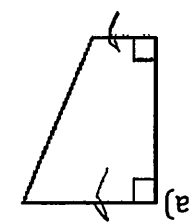
c) Square

$5y - 15 = 3y + 3 \Rightarrow 2y = 18 \Rightarrow y = 9$   
 $2x = 24 \Rightarrow x = 12$

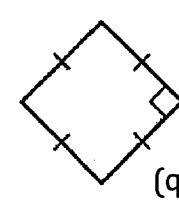
trapezoid

square

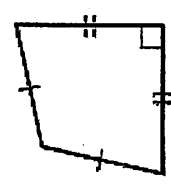
kite



a)



b)

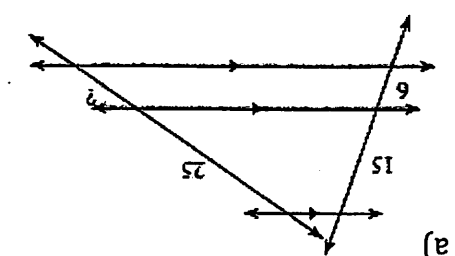


c)

17. Give the most specific name for the quadrilateral.

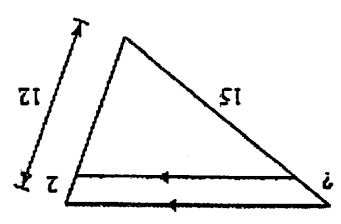
$\frac{15}{25} = \frac{6}{x}$

$x = 10$



a)

16. Find the missing part.



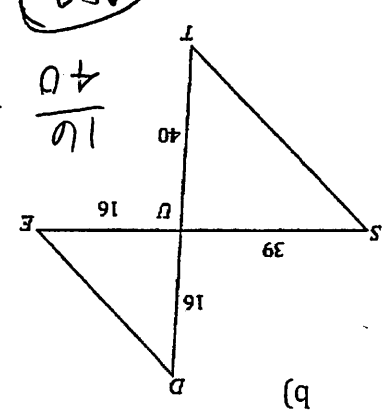
b)

$2x + 30 = 12x$   
 $30 = 10x$   
 $x = 3$

$10x = 30$   
 $x = 3$

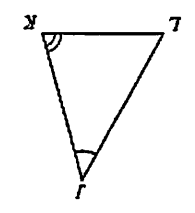
NO

$\frac{16}{40} \neq \frac{16}{39}$



b)

AA ~

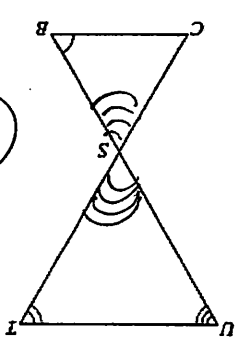


a)

15. Are the triangles similar? If yes, state how you know.

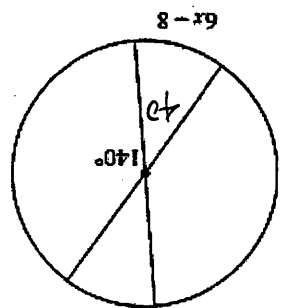
only one pair of  $\cong$   $\neq$  S

NO

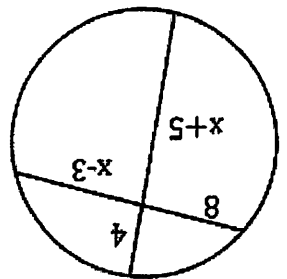


c)

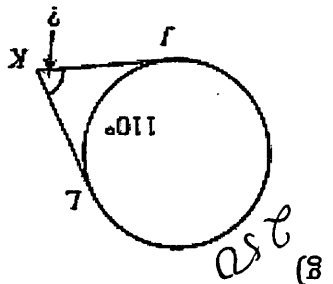
19. Find the value of x or the indicated value.



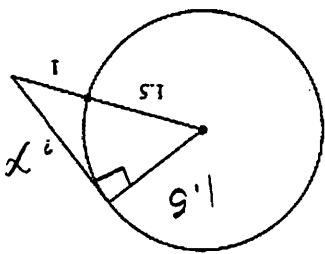
a)  $6x - 8 = 40$   
 $6x = 48$   
 $x = 8$



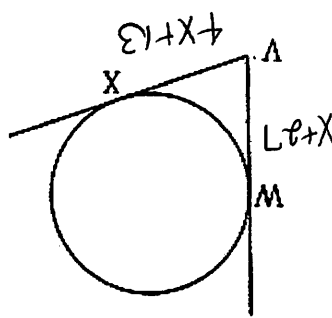
d)  $4(x+5) = 8(x-3)$   
 $4x + 20 = 8x - 24$   
 $44 = 4x$   
 $x = 11$



g)  $250 - 110 = 2x$   
 $x = 70$

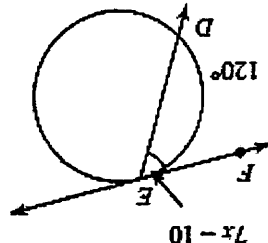


b)  $1.5^2 + x^2 = 2.5^2$   
 $2.25 + x^2 = 6.25$   
 $x^2 = 4$   
 $x = 2$

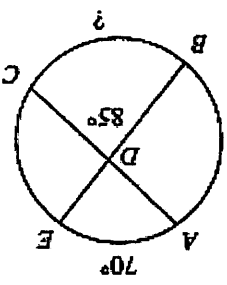


e)  $VW = x + 27, VX = 4x + 13$

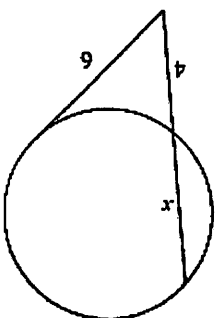
$x = \frac{14}{3}$   
 $14 = 3x$   
 $x + 27 = 4x + 13$



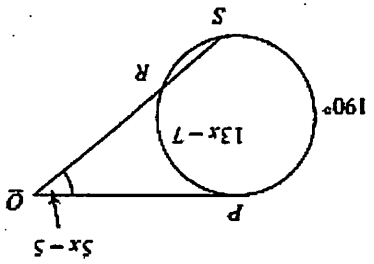
h)  $2(7x - 10) = 120$   
 $14x - 20 = 120$   
 $14x = 140$   
 $x = 10$



c)  $85 = 70 + x$   
 $15 = x$



f)  $6^2 = 4(4+x)$   
 $36 = 16 + 4x$   
 $20 = 4x$   
 $x = 5$



i)  $190 - (13x - 7) = 5x - 5$   
 $197 - 13x = 10x - 10$   
 $207 = 23x$   
 $x = 9$

20. Find the value of  $x$ .

a)  $\sin(x) = \cos(x)$

$$x + x = 90$$

$$2x = 90$$

$$x = 45$$

b)  $\sin(x + 10) = \cos(3x)$

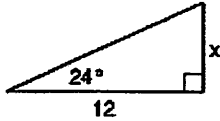
$$x + 10 + 3x = 90$$

$$4x = 80$$

$$x = 20$$

21. Find the value of  $x$ .

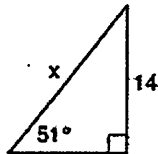
a)



$$\tan 24 = \frac{x}{12}$$

$$x = 5.3$$

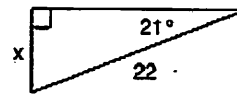
b)



$$\sin 51 = \frac{14}{x}$$

$$x = 18.0$$

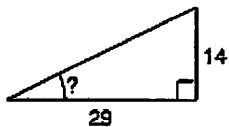
c)



$$\sin 21 = \frac{x}{22}$$

$$x = 7.9$$

d)

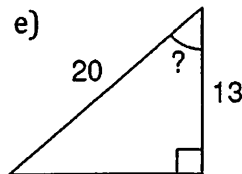


$$\tan x = \frac{14}{29}$$

$$x = \tan^{-1}\left(\frac{14}{29}\right)$$

$$x = 25.8^\circ$$

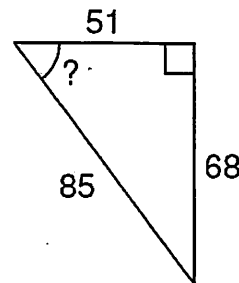
e)



$$x = \cos^{-1}\left(\frac{13}{20}\right)$$

$$x = 49.5^\circ$$

f)

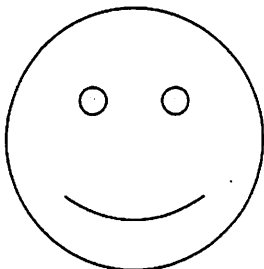


$$x = \sin^{-1}\left(\frac{68}{85}\right)$$

$$x = 53.1^\circ$$

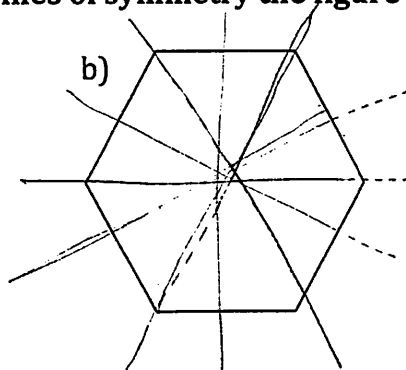
22. Identify the number of lines of symmetry the figure has then determine the angle of rotation for each diagram.

a)



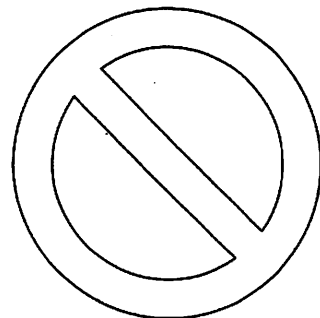
1, 360°

b)



6, 60°

c)



1, 180°

23. Given:  $m\angle P = (4x + 10)$  and  $m\angle S = (6x - 30)$ .

a) Find  $x$  if  $\angle P$  and  $\angle S$  are complementary.

$$4x + 10 + 6x - 30 = 90$$

$$10x - 20 = 90$$

$$10x = 110$$

$$x = 11$$

b) Find  $x$  if  $\angle P$  and  $\angle S$  are supplementary.

$$10x - 20 = 180$$

$$10x = 200$$

$$x = 20$$

24. Given the ratio of  $\angle P$  and  $\angle S$  is 2:7, find the measure of each angle if:

a)  $\angle P$  and  $\angle S$  are complementary.

$$2x + 7x = 90$$

$$9x = 90$$

$$x = 10$$

$$20^\circ, 70^\circ$$

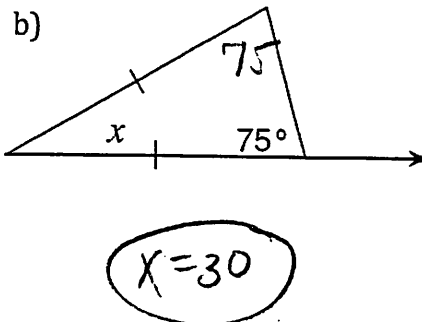
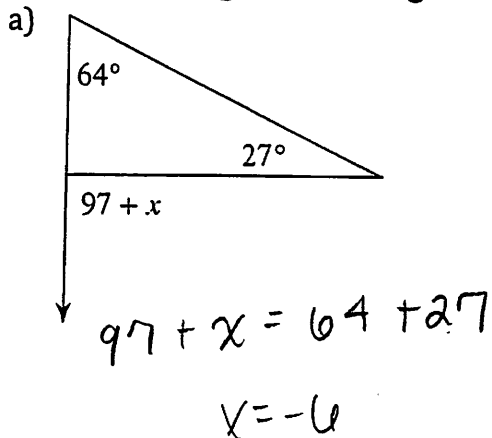
b)  $\angle P$  and  $\angle S$  are supplementary.

$$9x = 180$$

$$x = 20$$

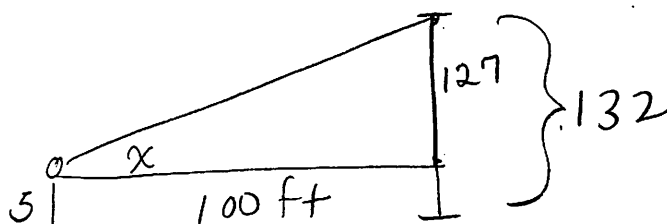
$$40^\circ, 140^\circ$$

25. Solve for  $x$  given the diagram.



26. Draw a diagram to solve the problem.

A person whose eyes are 5 feet above the ground is standing on the runway of an airport 100 feet from the control tower. That person observes an air traffic controller at the window of the 132-foot tower. What is the angle of elevation?



$$\tan x = \frac{127}{100}$$

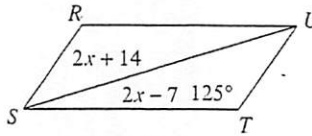
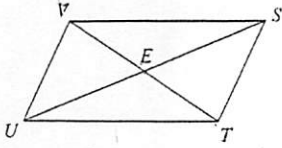
$$x = 51.8^\circ$$



27. The following figures are parallelograms. Find the indicated value.

a)  $TE = 4 + 2x$   
 $EV = 4x - 4$   
 Find  $TE$

b) Find  $m\angle TSR$



$TE = 12$

$4 + 2x = 4x - 4$   
 $8 = 2x$ ,  $x = 4$

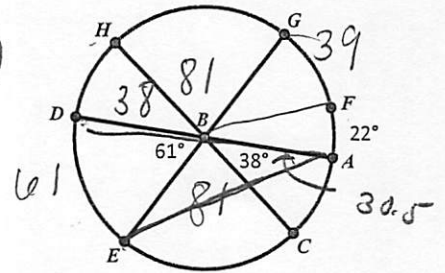
$55^\circ$

$125 + 2x - 7 + 2x + 14 = 180$   
 $4x + 132 = 180$   
 $4x = 48$   
 $x = 12$

28. Given circle B with diameters  $\overline{HC}$ ,  $\overline{EG}$ , and  $\overline{DA}$  find the following:

a)  $m\angle HBD = 38^\circ$       b)  $m\angle DAE = 30.5$  (inscribed)

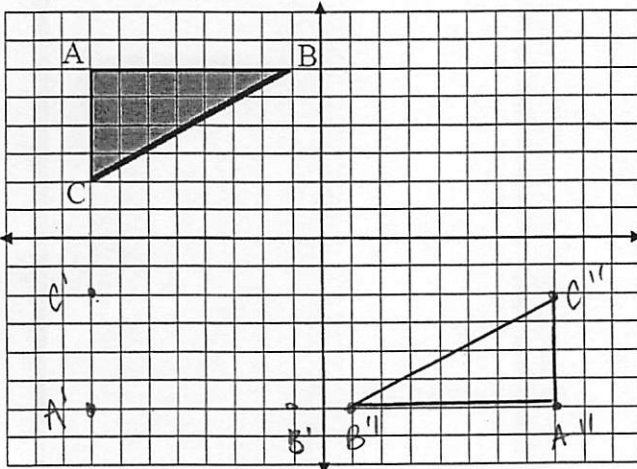
c)  $m\widehat{GF} = 39$       d)  $m\widehat{HGE} = 201$



29. Perform each composite transformation.

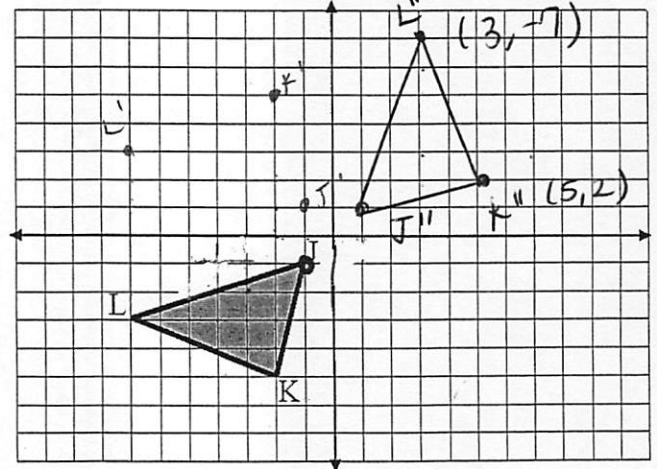
1.  $R_y \text{ axis} \circ R_x \text{ axis}$

- ① reflect over x
- ② reflect over y



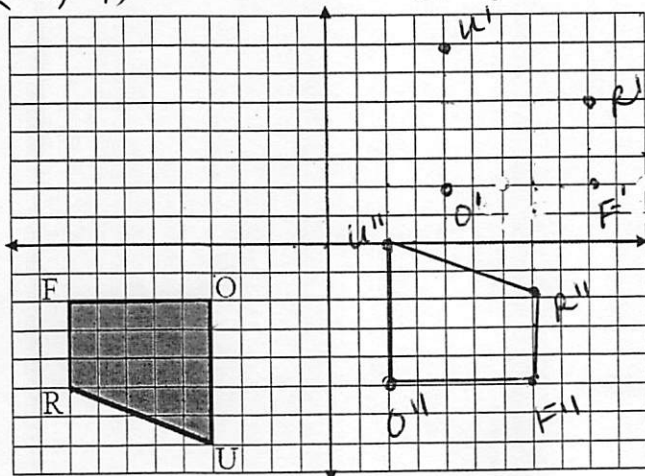
2.  $R_{O, 90^\circ} \circ R_x \text{ axis}$

- ① reflect over x
- ② rotate  $-90^\circ$

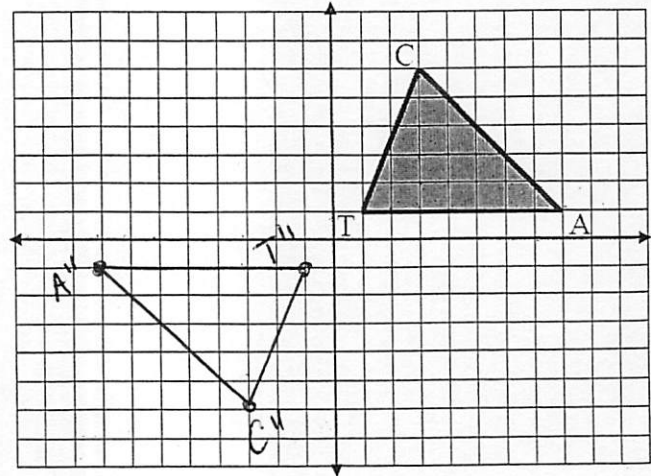


3.  $T_{\langle 2, 7 \rangle} \circ R_{O, 180^\circ}$   
 $\langle -2, -7 \rangle$

- ① rotate 180
- ② right 2, up 7



4.  $R_{O, 90^\circ} \circ R_{O, 90^\circ} \rightarrow$  rotate 180



30. Perform the composite transformation and answer the questions.

a. What kind of transformation is the result from ABC to A''B''C''?

translation, 14 units

right

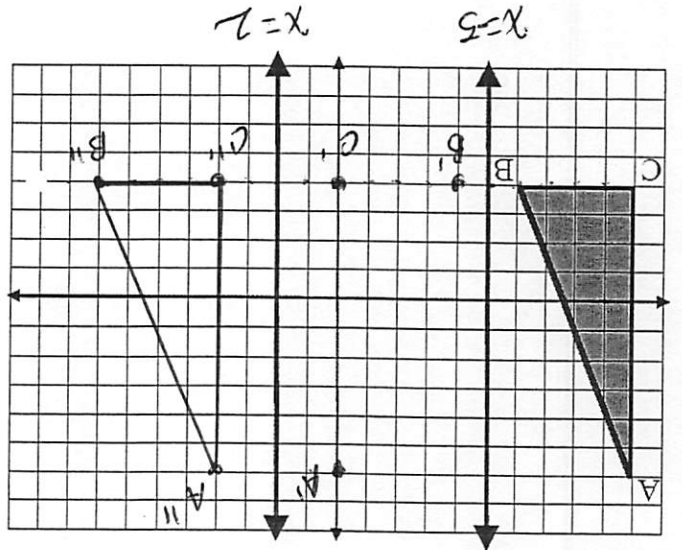
c. Describe the transformation. What is the distance between A and A''?

14

d. What is the relationship between the distance of the transformation and the distance between the parallel lines? → 7

twice the distance between the lines

31. Use the coordinate plane to partition the line segments as indicated.



$R_x = 2$ ,  $R_x = -5$

b) Partition segment EF into a ratio of 3:1 where E(2, -5) and F(-6, 7).

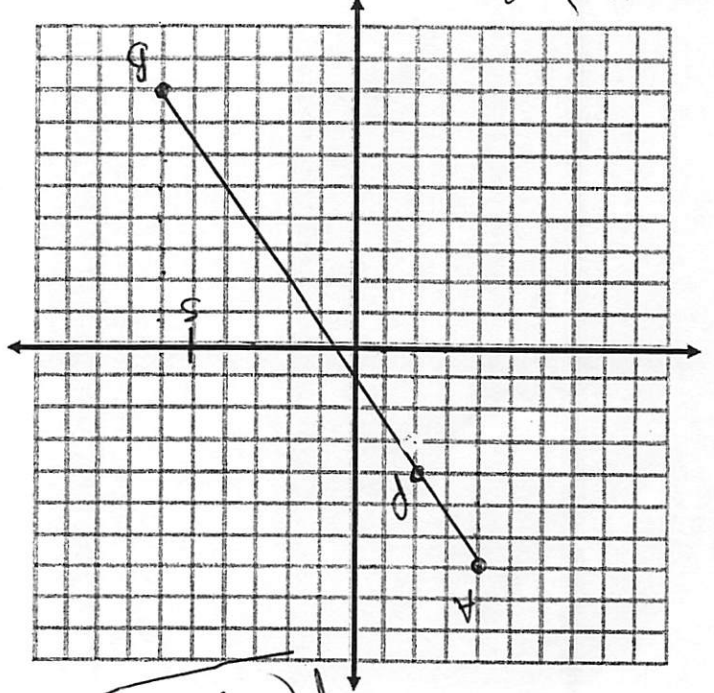
$(-4, 4)$

$4/3$

a) Partition segment AB into a ratio of 1:4 where A(-4, 7) and B(6, -8).

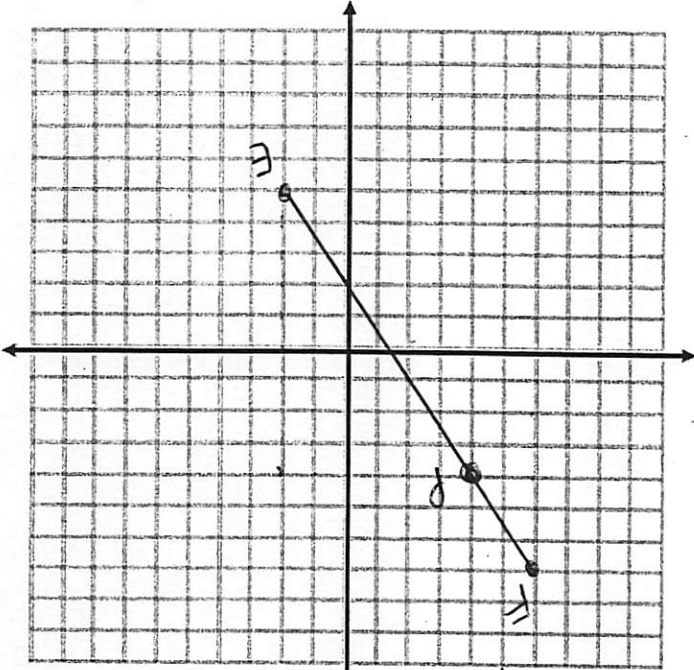
$(-2, 4)$

$5/3$



$-\frac{15}{10} = -\frac{3}{2}$

down 3, over 2 from A

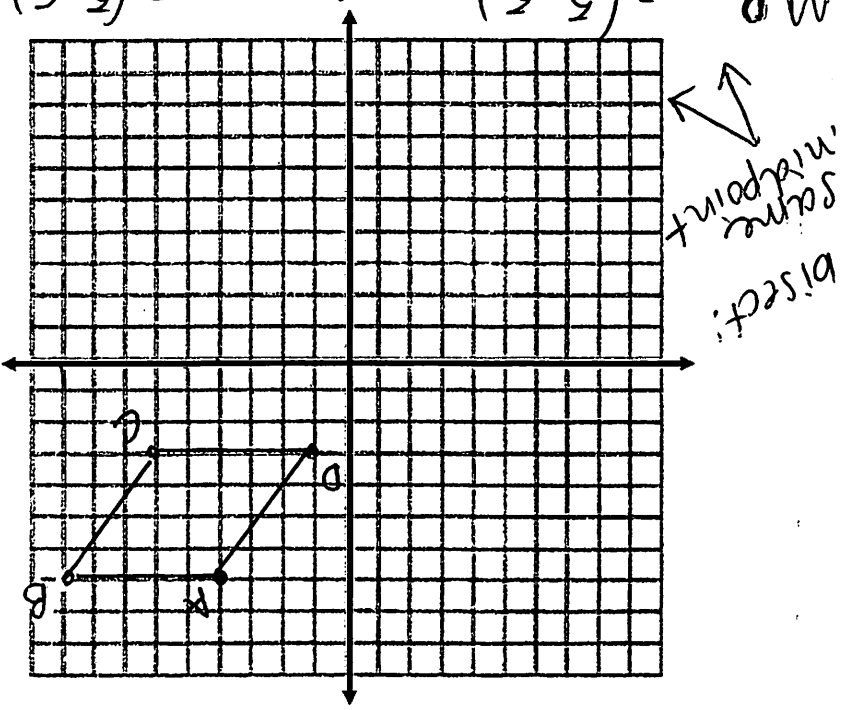


$\frac{12}{-8} = \frac{3}{4}$

up 9, left 6 from E

32. Points A, B, C and D are the vertices of a quadrilateral. Give the most specific name for ABCD. Explain your reasoning using the properties of the diagonals.

A(4,7), B(9,7), C(6,3), and D(1,3) \* change points?



M.P. AC = (5,5)

M.P. DB = (5,5)

Rhombus  $\rightarrow$  diagonals bisect (share midpoint), are  $\perp$ , not  $\cong$

$AC \neq BD$

$$BD = \sqrt{8^2 + 4^2} = \sqrt{80}$$

$$AC = \sqrt{2^2 + 4^2}$$

$$AC = \sqrt{2^2 + 4^2}$$

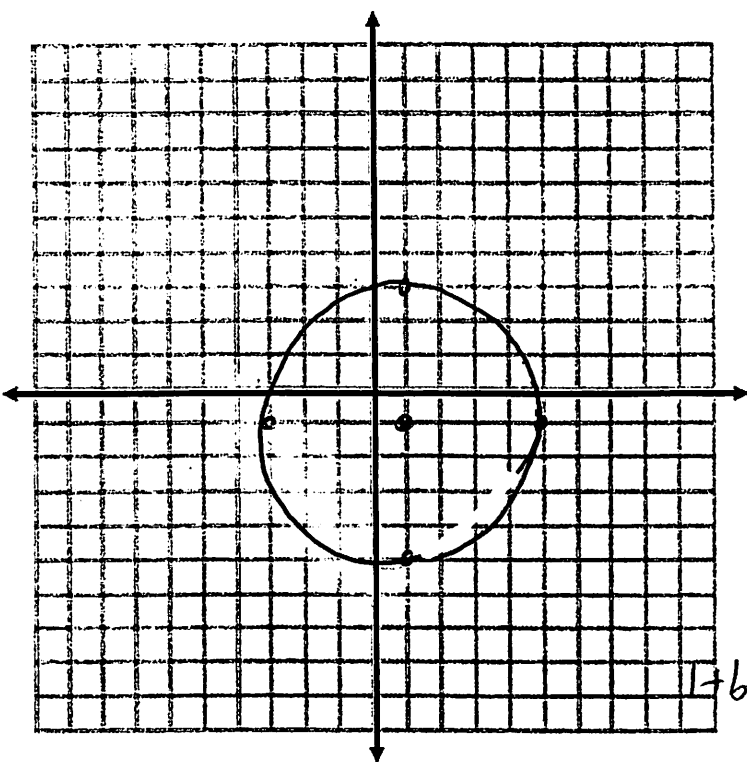
$AC \perp BD$

$$m_{BD} = \frac{8}{4} = \frac{1}{2}$$

$$m_{AC} = -\frac{2}{4} = -\frac{1}{2}$$

32. Use completing the square to find the equation of the circle in standard form. Then complete the question.

Graph the circle with the equation  $x^2 - 6x + y^2 + 2y = 6$  translated 4 units left and 2 units up.



$$x^2 - 6x + 9 + y^2 + 2y + 1 = 6 + 9 + 1$$

$$(x-3)^2 + (y+1)^2 = 16$$

$$(3, -1) \quad r = 4$$

$$(-1, 1) \quad r = 4$$