

# Geo H

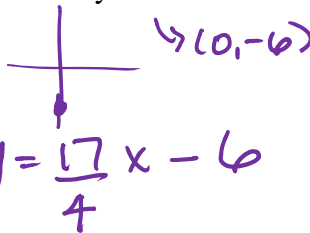
## 4.6, transformations review

1. Calculate the slope between  $(-8, 2)$  and  $(4, -11)$ .

$$m = \frac{-11 - 2}{4 - (-8)} = \frac{-13}{12}$$

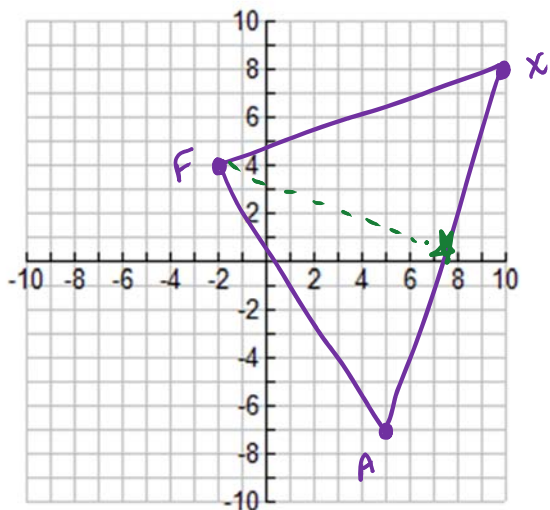
2. Write the equation of the line through the y-intercept of  $3x - 4y = 24$  and

perpendicular to  $y = -\frac{4}{17}x + 2$ .



$$y + 6 = \frac{17}{4}(x - 0) \quad \text{OR} \quad y = \frac{17}{4}x - 6$$

3. Triangle FAX has the coordinates  $F(-2, 4)$ ,  $A(5, -7)$ , and  $X(10, 8)$ . Write the equation of the median from  $F$  to  $\overline{AX}$ .



Need midpoint  
 $(7.5, .5)$

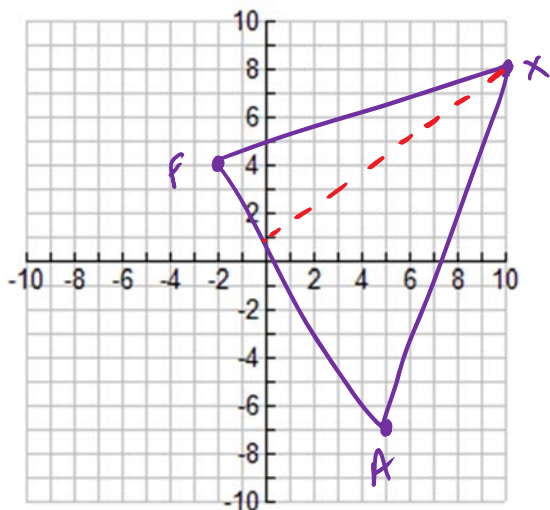
$$m_{F\text{mid}} = \frac{0.5 - 4}{7.5 - (-2)} = \frac{-3.5}{9.5} = -\frac{7}{19}$$

$$y - 4 = -\frac{7}{19}(x + 2)$$

OR

$$y - 0.5 = -\frac{7}{19}(x - 7.5)$$

4. Triangle FAX has the coordinates  $F(-2, 4)$ ,  $A(5, -7)$ , and  $X(10, 8)$ . Write the equation of the altitude from  $X$  to  $\overline{FA}$ .

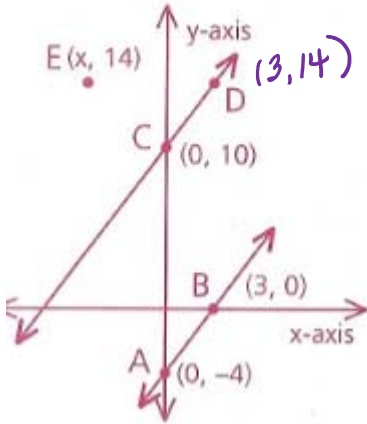


Need  $\perp$  to  $\overline{FA}$

$$m_{\overline{FA}} = \frac{-7 - 4}{5 - (-2)} = \frac{-11}{7}$$

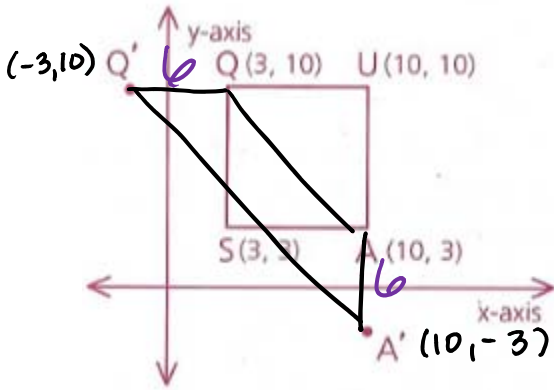
$$y - 8 = \frac{7}{11}(x - 10)$$

5. D is the reflection of E = (x, 14) across the y-axis. If  $\overline{CD} \parallel \overline{AB}$ , solve for x.



$$x = -3$$

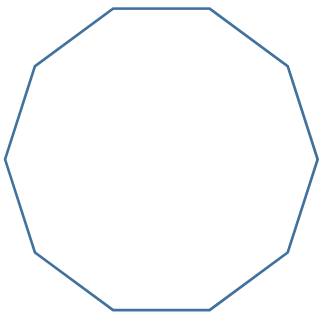
6. What is the most descriptive name for the quadrilaterals SQUA and Q'QAA', where Q' is the reflection of Q over the y-axis and A' is the reflection of A over the x-axis? Justify your conclusions.



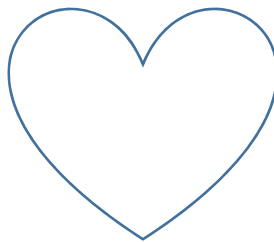
SQUA is a square - it is a rectangle ( $m_{\overline{QU}} = 0$  &  $m_{\overline{UA}}$  is undefined  $\rightarrow 90^\circ$ )  
 & rhombus (all sides =)

$m_{\overline{Q'A'}} = m_{\overline{QA}}$  &  $Q'Q = AA'$   
 Therefore, Q'QAA' is an isos trapezoid.

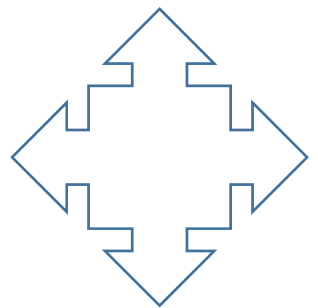
7. Draw lines of symmetry and discuss rotational symmetry (both degree and order), if any, for the following figures. Assume that when sides look congruent, they are congruent, and when angles look congruent, they are congruent.



10 lines of symmetry  
 $36^\circ$  rotational symmetry  
 order 10



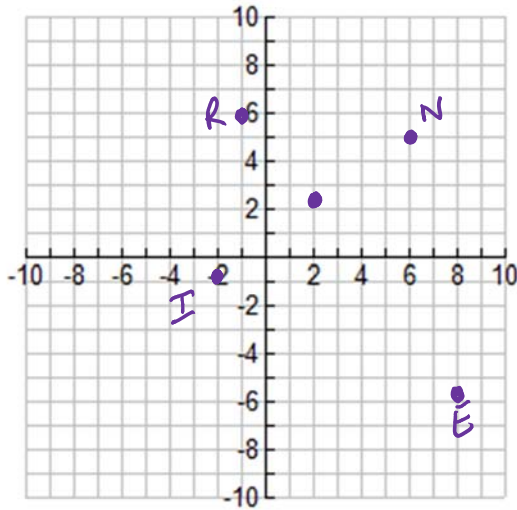
1 line of symmetry



4 lines of symmetry  
 $90^\circ$  rotational symmetry  
 order 4

8. What is the most specific name for the quadrilateral with vertices  $(-1, 6)$ ,  $(8, -6)$ ,  $(-2, -1)$ , and  $(6, 5)$ ?  
Please justify your argument with algebra.

R E I N



$$m_{\overline{RN}} = \frac{5-6}{6-(-1)} = \frac{-1}{7}$$

$$m_{\overline{RI}} = \frac{6-(-1)}{-1-(-2)} = 7$$

$$m_{\overline{NE}} = \frac{5-(-6)}{6-8} = \frac{11}{-2}$$

$$m_{\overline{IE}} = \frac{-1+6}{-2-8} = \frac{5}{-10} = \frac{-1}{2}$$

$$m_{\overline{RE}} = \frac{-6-6}{8-(-1)} = \frac{-12}{9} = \frac{-4}{3}$$

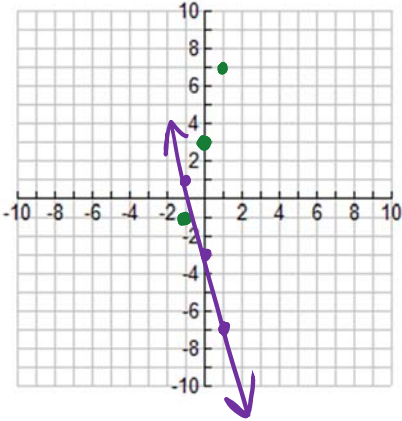
$$\text{midpt of } \overline{IN} = (2, 2)$$

$$m_{\overline{IN}} = \frac{5+(-1)}{6-(-2)} = \frac{4}{8} = \frac{1}{2}$$

kite - one diagonal  
is  $\perp$  bis of other

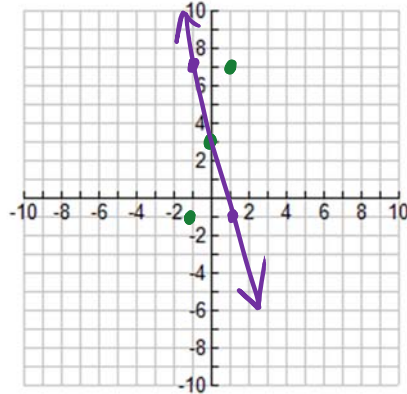
9. Write the equation of the image of the line  $y = 4x + 3$  under the following transformations:

a. Reflect across the x-axis



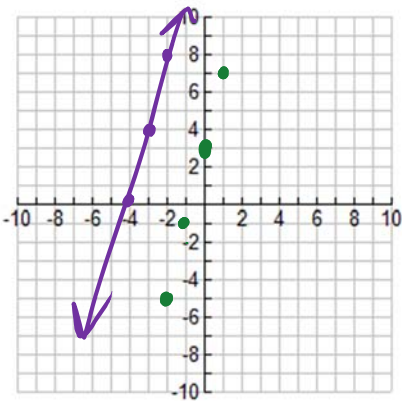
$$y = -4x - 3$$

b. Reflect across the y-axis



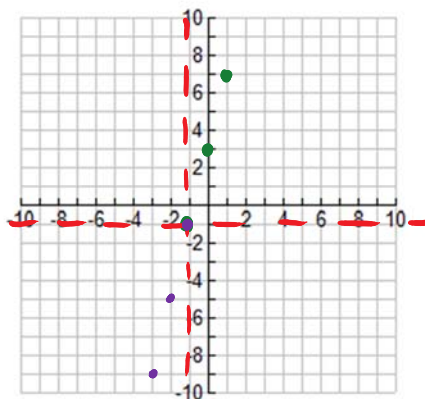
$$y = -4x + 3$$

c. Translate with vector  $\langle -2, 5 \rangle$



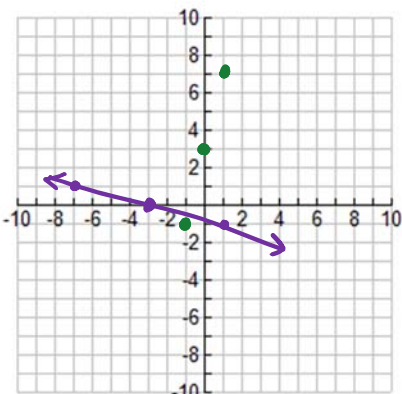
$$y - 4 = 4(x + 3)$$

d. Reflect across  $x = -1$  and then  $y = -1$



$$y = 4x + 3 \text{ same line!}$$

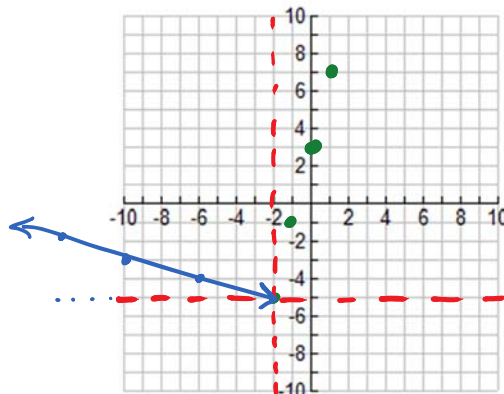
e. Rotate  $90^\circ$  about the origin



$$\begin{aligned} (0, 3) &\rightarrow (-3, 0) \\ (1, 7) &\rightarrow (-7, 1) \\ (-1, -1) &\rightarrow (1, -1) \end{aligned}$$

$$y + 1 = -\frac{1}{4}(x - 1)$$

f. Rotate  $90^\circ$  about  $(-2, -5)$



$$\begin{aligned} (1, 4) &\rightarrow (-4, 1) \\ (2, 8) &\rightarrow (-8, 2) \\ (3, 12) &\rightarrow (-12, 3) \end{aligned}$$

$$y - 1 = -\frac{1}{4}(x + 4)$$