

Compete all questions on graph paper and use a coordinate grid for each question. Accurately plot points and answer questions.

1. On a coordinate axes, graph the following points: $A(1,2)$, $B(5,1)$, $C(6,3)$, & $D(2,5)$. Connect to make a quadrilateral. On the same set of axes as ABCD, graph the points to create the quadrilateral PQRS: $P(-1,-1)$, $Q(3,-2)$, $R(4,0)$, & $S(0,2)$. What translation describes ABCD being carried onto PQRS? Use mathematical notation for translation and describe the translation in words. For example, " $(x,y) \rightarrow (x+21, y-18)$ describes a horizontal shift 21 units to the right and 18 units down."

2. You may complete this question with or without graphing.
 Triangle JKL has these lattice vertex points: $J(3,8)$, $K(7,5)$, & $L(4,1)$.
 A) Describe what the translation $(x, y) \rightarrow (x+2, y-5)$ will do to triangle JKL.
 B) State the coordinates for the three vertices of the image $J'K'L'$ resulting from this translation.

3. On a coordinate axes, graph triangle ABC given by the points: $A(-5,0)$, $B(5,0)$, & $C(2,6)$. On the same axes graph the triangle KLM given by the points: $K(5,-2)$, $L(13,4)$, & $M(7,7)$.
 A) Find the length of all three sides of triangle ABC leaving answers as square roots.
 B) Find the lengths of all three sides of triangle KLM leaving answers in square roots.
 C) Are triangles ABC and KLM congruent? Why do you think so? ... Or why do you think not?
 D) Describe a combination of transformations that would carry triangle ABC onto triangle KLM.

4. On a coordinate grid, graph triangle ABC given by the points: $A(2,4)$, $B(4,5)$, & $C(6,1)$
 On the same set of axes, graph triangle PQR: $P(11,1)$, $Q(10,-1)$, & $R(6,1)$
 On the same set of axes, graph triangle KLM: $K(8,10)$, $L(7,8)$, & $M(11,6)$
 On the same set of axes, graph triangle TUV: $T(-2,6)$, $U(0,5)$, & $V(2,9)$
 Are these triangles congruent? Can you describe the transformations that would carry triangle ABC the pre-image onto each of the three images: triangle PQR, triangle KLM and triangle TUV?
 Be specific in your descriptions of the transformations. If there is a reflection, state the equation of the line of reflection. If there is a rotation, state what direction about what point and the angle measure. If there is a translation, use the notation illustrated in #1. If there is a combination of transformations, state each transformation specifically.

5. On a coordinate axes, plot the points to create triangle KLM: $K(0,0)$, $L(7,-1)$, & $M(9,3)$ and triangle PQR: $P(6,7)$, $Q(10,5)$, & $R(1,2)$. These two triangles are congruent. Complete the chart to corresponding congruent angles and the corresponding congruent sides. You may need to determine lengths of sides of each triangle before completing the chart.

Triangle KLM	Angle K	Angle L	Angle M	Side KL	Side KM	Side LM
Triangle	Angle	Angle	Angle	Side	Side	Side

Describe the combination of transformations that carry triangle KLM onto triangle PQR. Be specific when stating all translations.

6. Graph on a coordinate axes an equilateral hexagon whose sides are $\sqrt{13}$ units. Name all 6 lattice point vertices of your hexagon. Hint: what are the dimensions of a rectangle that has a diagonal $\sqrt{13}$ long.