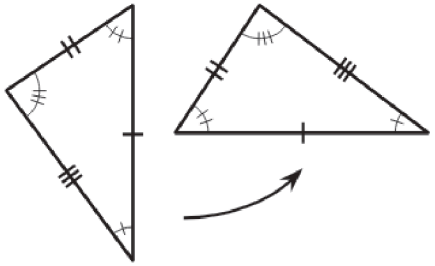
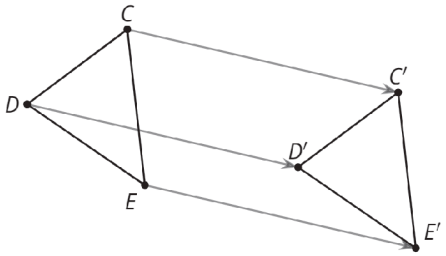
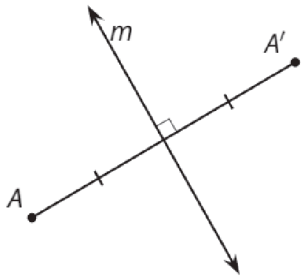
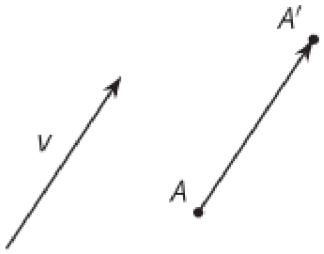
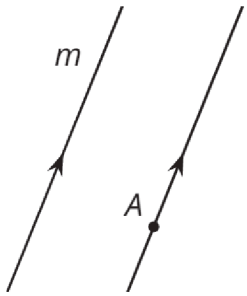
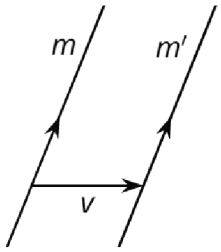
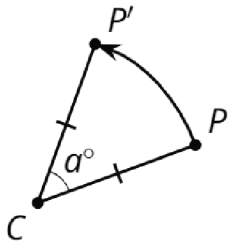
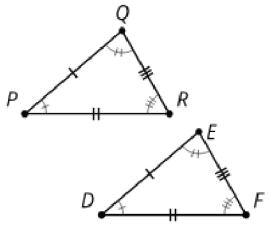
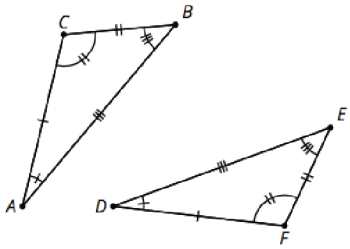
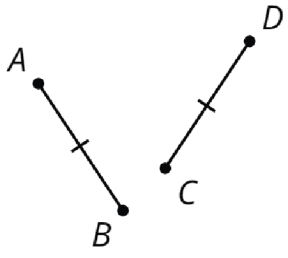
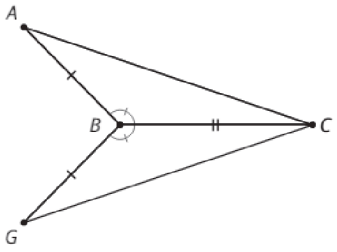
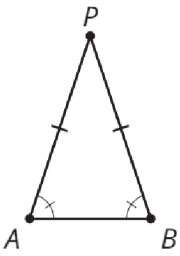
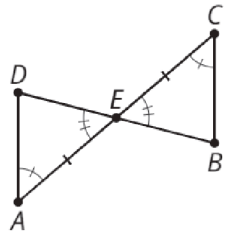
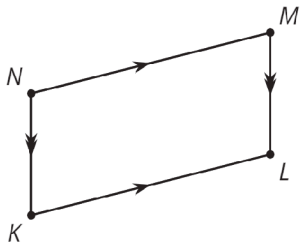
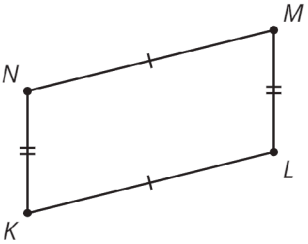
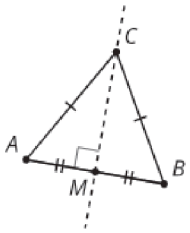
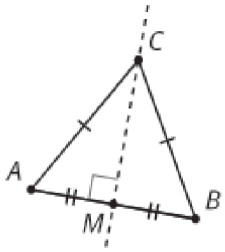
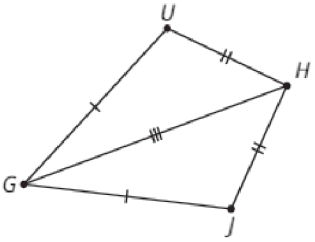
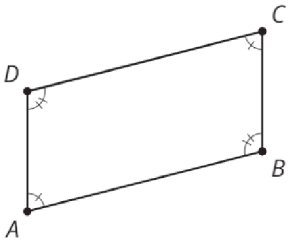
date, type	statement	diagram

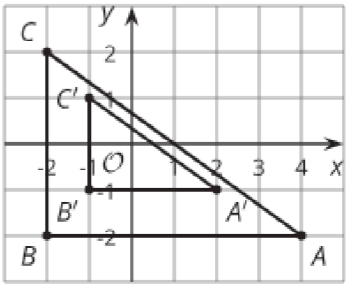
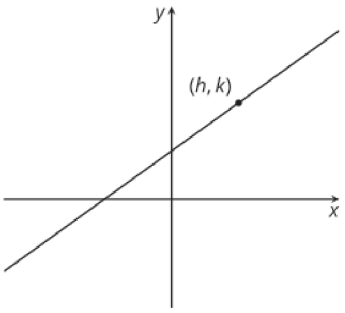
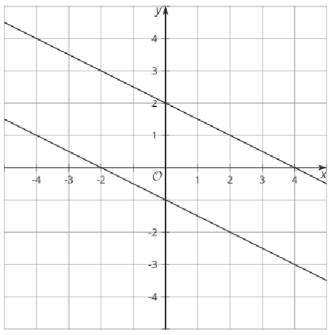
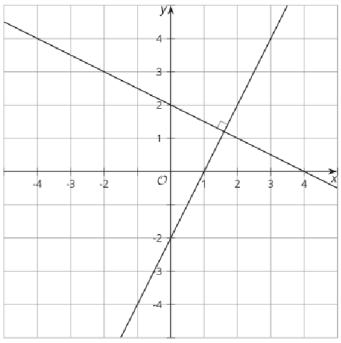
CC BY NC 2024 Illustrative Mathematics®

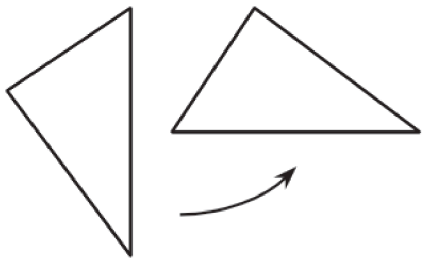
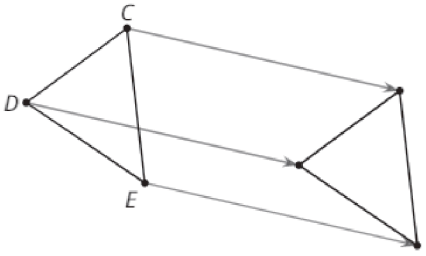
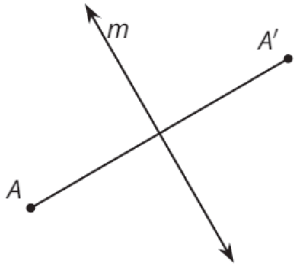
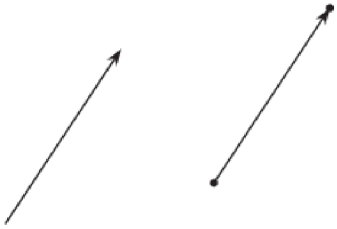
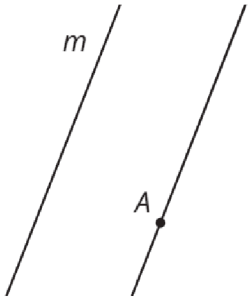
lesson, type	statement	diagram
U1, L10 (students write the date) assertion	A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three. Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length.	
U1, L10 definition	Two figures are **congruent** if there is a sequence of translations, rotations, and reflections that takes one figure exactly onto the other. The second figure is called the image of the rigid transformation.	 $\triangle EDC \cong \triangle E'D'C'$
U1, L11 definition	**Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, that is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line. "Reflect _(object)_ across line _(name)_."	 Reflect *A* across line *m*.
U1, L12 definition	**Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction. "Translate _(object)_ by the directed line segment _(name or from [point] to [point])_."	 Translate *A* by the directed line segment *v*.
U1, L12 assertion	**Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*.	

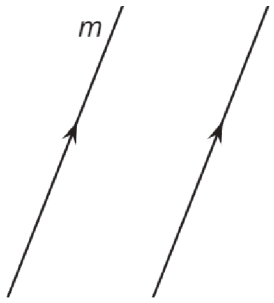
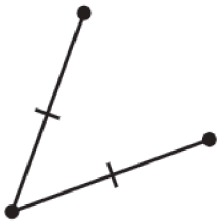
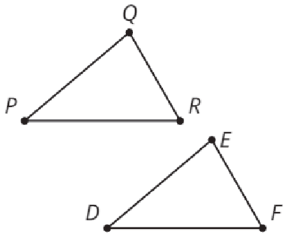
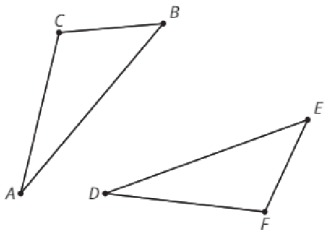
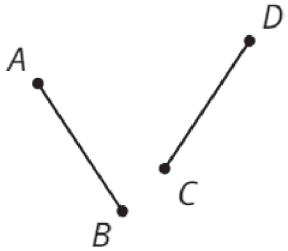
lesson, type	statement	diagram
U1, L12 theorem	Translations take lines to parallel lines or to themselves.	 $m \parallel m'$
U1, L14 definition	**Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii, the one from the center to the original point and the one from the center to the image, make the given angle. "Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_."	 Rotate P counterclockwise by $a°$ using center C.
U2, L1 theorem	If two figures are congruent, then **corresponding** parts of those figures must be congruent	 $\triangle DEF \cong \triangle PQR$ so $\overline{PQ} \cong \overline{DE}$, $\overline{PR} \cong \overline{DF}$, $\overline{QR} \cong \overline{EF}$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$
U2, L3 theorem	If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent.	 $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$, $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\angle C \cong \angle F$ so $\triangle ABC \cong \triangle DEF$
U2, L5 theorem	If two segments have the same length, then they are congruent.	 $AB=CD$, so $\overline{AB} \cong \overline{CD}$

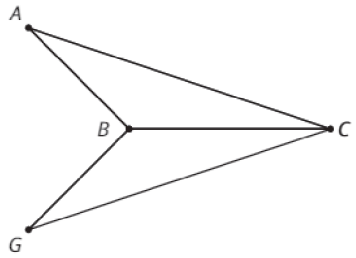
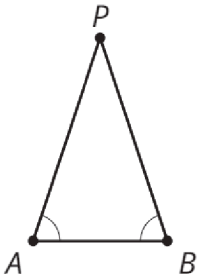
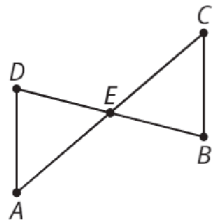
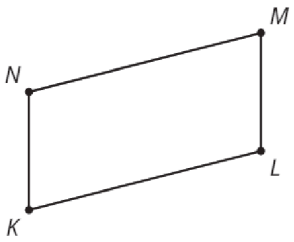
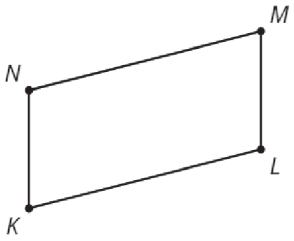
lesson, type	statement	diagram
U2, L6 theorem	**Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent.	 $\overline{AB} \cong \overline{GB}$, $\overline{BC} \cong \overline{BC}$, $\angle ABC \cong \angle GBC$ so $\triangle ABC \cong \triangle GBC$
U2, L6 theorem	**Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent.	 $\overline{AP} \cong \overline{PB}$, so $\angle A \cong \angle B$
U2, L7 theorem	**Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles are congruent and the pair of corresponding sides between the angles is congruent, then the triangles must be congruent.	 $\angle A \cong \angle C$, $\overline{AE} \cong \overline{EC}$, $\angle DEA \cong \angle BEC$, so $\triangle DEA \cong \triangle BEC$
U2, L7 definition	A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel.	 *NM* ∥ *KL*, *NK* ∥ *ML*, so *MNKL* is a parallelogram
U2, L7 theorem	In a parallelogram, pairs of opposite sides are congruent.	 *MNKL* is a parallelogram, so $\overline{NM} \cong \overline{KL}$, $\overline{NK} \cong \overline{ML}$

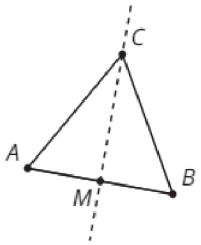
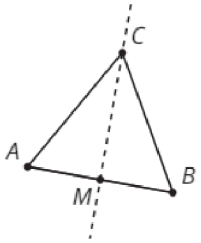
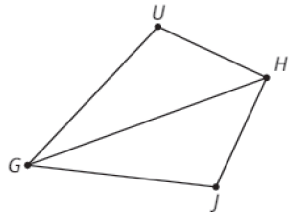
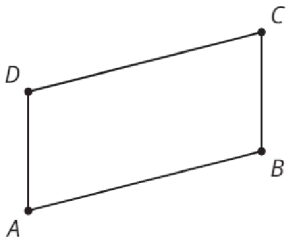
lesson, type	statement	diagram
U2, L8 theorem	If a point *C* is the same distance from *A* as it is from *B*, then *C* must be on the perpendicular bisector of *AB*.	 $\overline{AC} \cong \overline{BC}$, so *C* is on the line through midpoint *M* perpendicular to $\overline{AB}$.
U2, L8 theorem	If *C* is a point on the perpendicular bisector of *AB*, the distance from *C* to *A* is the same as the distance from *C* to *B*.	 $AB \perp CM$, $\overline{AM} \cong \overline{BM}$, so $\overline{AC} \cong \overline{BC}$
U2, L9 theorem	**Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent.	 $\overline{HU} \cong \overline{HJ}$, $\overline{UG} \cong \overline{JG}$, $\overline{HG} \cong \overline{HG}$, so $\triangle HUG \cong \triangle HJG$
U2, L9 theorem	In a parallelogram, opposite angles are congruent.	 *ABCD* is a parallelogram, so $\angle A \cong \angle C$, $\angle D \cong \angle B$

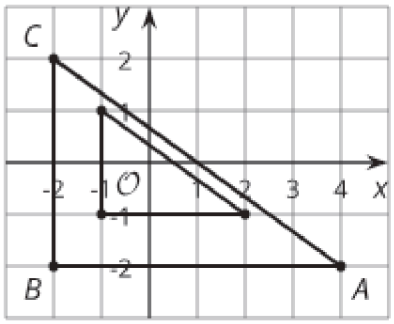
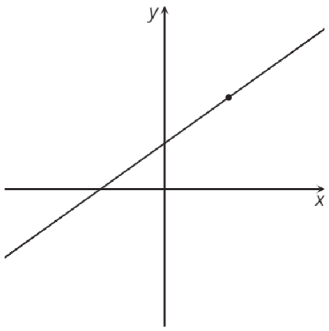
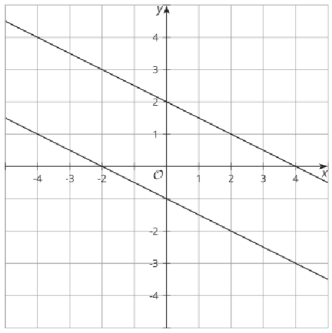
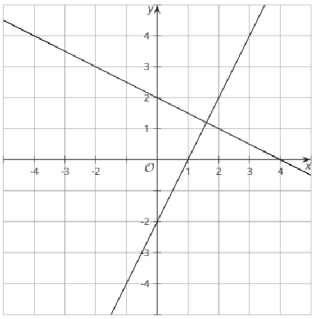
lesson, type	statement	diagram
U5, L2 definition	A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor.	
U5, L4 definition	The **point-slope form** of the equation of a line is $y - k = m(x - h)$ where (h, k) is a particular point on the line and m is the slope of the line.	
U5, L5 theorem	Lines are parallel if and only if they have equal slopes.	
U5, L6 theorem	Lines are perpendicular if and only if their slopes are opposite reciprocals.	

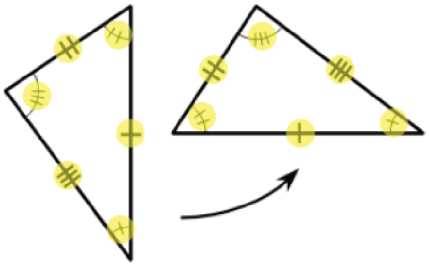
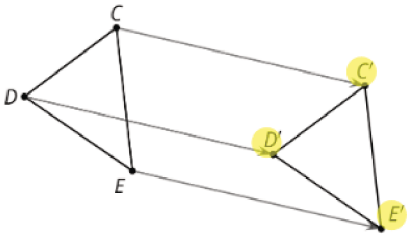
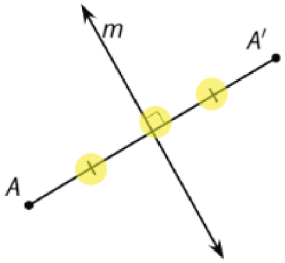
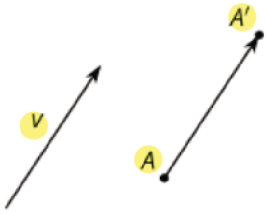
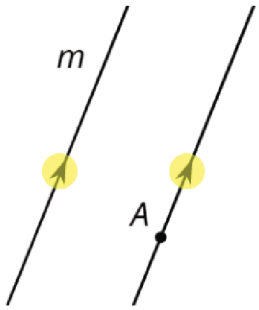
date, type	statement	diagram
assertion	A _____ is a _____, _____, _____, or any sequence of the three. Rigid transformations take lines to _____, angles to _____ of the same measure, and segments to _____ of the same length.	
definition	One figure is _____ to another if there is a sequence of _____, _____, and _____ that takes the first figure _____ onto the second figure. The second figure is called the _____ of the rigid transformation.	
definition	_____ is a rigid transformation that takes a point to another point that is the same _____ from the given line, and so that the segment from the original point to the image is _____ to the given line. "Reflect _(object)_ across line _(name)_."	 Reflect *A* across line *m*.
definition	_____ is a rigid transformation that takes a point to another point so that the directed _____ from the original point to the image is _____ to the given line segment and has the same _____ and _____. "Translate _(object)_ by the directed line segment _(name or from [point] to [point])_."	 Translate *A* by the directed line segment *v*.
assertion	**Parallel Postulate:** Given a _____ *m* and a _____ *A* that is not on _____, there is exactly _____ that goes through *A* that is _____ to *m*.	

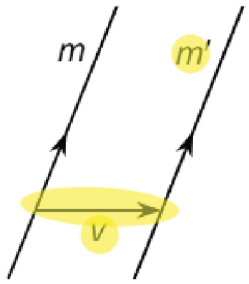
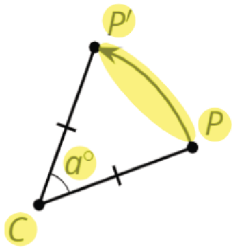
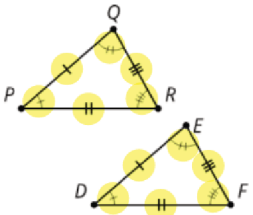
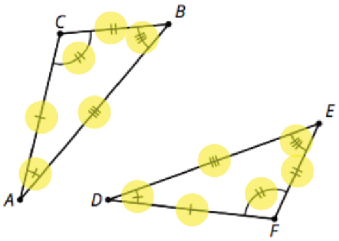
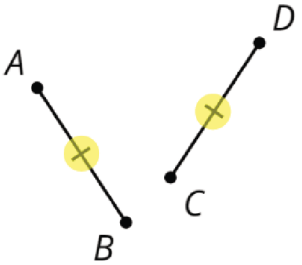
date, type	statement	diagram
theorem	_____ take lines to _____ or to _____.	
definition	_____ is a _____ transformation that takes a point to another point on the circle through the original point with the given _____. The two radii to the original point and the image make the given _____. "Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_."	 Rotate *P* counterclockwise by *a*° using center *C*.
theorem	If two figures are _____, then _____ parts of those figures must be _____.	 $\triangle PQR \cong \triangle DEF$ so *PQ=DE, PR=DF, QR=EF,* $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$
theorem	If all pairs of corresponding _____ and all pairs of corresponding _____ are congruent, then the _____ must be _____.	 *AB=DE, BC=EF, CA=FD,* $\angle B \cong \angle E$, $\angle A \cong \angle D$, $\angle C \cong \angle F$ so
theorem	If two _____ have the same _____, then they are _____.	

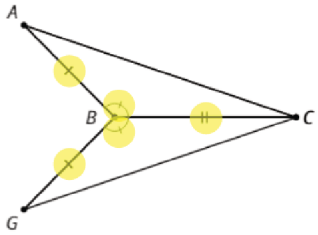
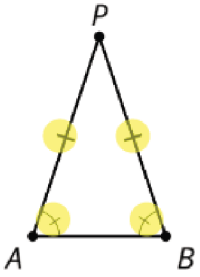
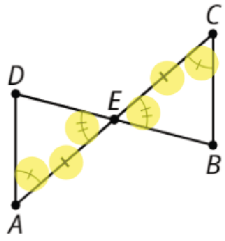
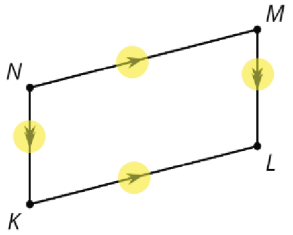
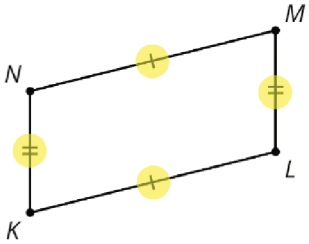
date, type	statement	diagram
theorem	_____ **Triangle Congruence Theorem:** In two triangles, if two pairs of congruent _____ and the pair of corresponding _____ between the sides are _____, then the two triangles are _____.	 *AB=GB*, *BC=BC*, $\angle ABC \cong \angle GBC$ so
theorem	_____ **Triangle Theorem:** In an _____ triangle, the _____ are _____.	
theorem	_____ **Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding _____, and the pair of corresponding _____ between the angles are _____, then the triangles must be _____.	 $\angle A \cong \angle C$, *AE=EC*, $\angle DEA \cong \angle BEC$, so
definition	A _____ is a quadrilateral with two pairs of _____ sides _____.	 *NM* // *KL*, *NK* // *ML*, so
theorem	In a _____, pairs of _____ sides are _____.	 *MNKL* is a parallelogram, so

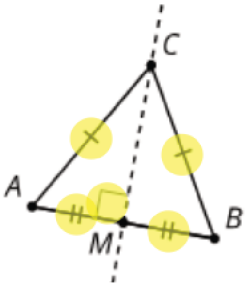
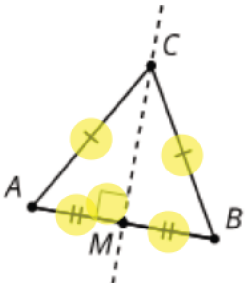
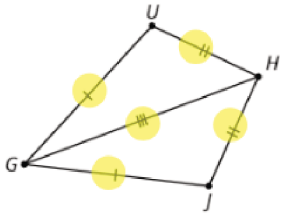
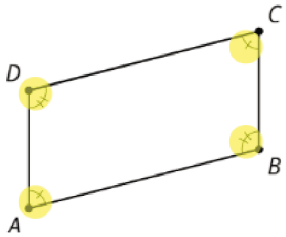
date, type	statement	diagram
theorem	If a _____ *C* is the same _____ from _____ as it is from _____, then *C* must be on the _____ of *AB*.	 *AC=BC*, *M* is the midpoint, so
theorem	If *C* is a point on the _____ of segment *AB*, the distance from _____ to _____ is the same as the _____ from _____ to _____.	 *AB*⊥*CM*, *AM=BM*, so
theorem	_____ **Triangle Congruence Theorem:** In two triangles, if _____ of corresponding _____ are congruent, then the triangles must be _____.	 *HU=HJ*, *UG=JG*, *HG=HG* so
theorem	In a _____, _____ angles are _____.	 *ABCD* is a parallelogram, so

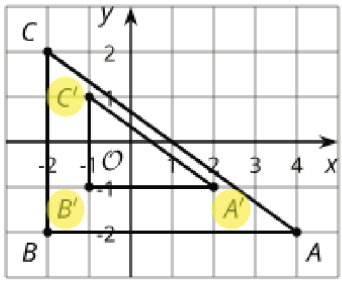
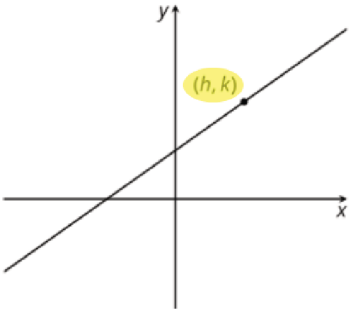
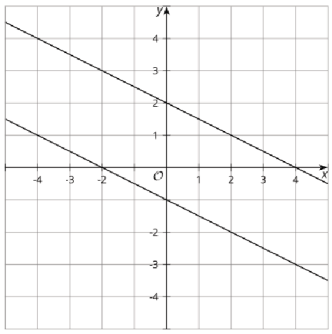
date, type	statement	diagram
definition	A _____ is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "_____." All of the original distances are multiplied by the same _____.	
definition	The _____ form of the equation of a line is _____ where (h, k) is a particular _____ on the line and m is the _____ of the line.	
theorem	Lines are _____ if and only if they have _____.	
theorem	Lines are _____ if and only if their _____ are _____.	

lesson, type	statement	diagram
U1, L10 (students write the date) assertion	A **rigid transformation** is a translation, reflection, rotation, or any sequence of the three. Rigid transformations take lines to lines, angles to angles of the same measure, and segments to segments of the same length.	
U1, L10 definition	One figure is **congruent** to another if there is a sequence of translations, rotations, and reflections that takes the first figure exactly onto the second figure. The second figure is called the image of the rigid transformation.	 $\triangle EDC \cong \triangle E'D'C'$
U1, L11 definition	**Reflection** is a rigid transformation that takes a point to another point that is the same distance from the given line, is on the other side of the given line, and so that the segment from the original point to the image is perpendicular to the given line. "Reflect _(object)_ across line _(name)_."	 Reflect *A* across line *m*.
U1, L12 definition	**Translation** is a rigid transformation that takes a point to another point so that the directed line segment from the original point to the image is parallel to the given line segment and has the same length and direction. "Translate _(object)_ by the directed line segment _(name or from [point] to [point])_."	 Translate *A* by the directed line segment *v*.
U1, L12 assertion	**Parallel Postulate:** Given a line *m* and a point *A* that is not on *m*, there is exactly one line that goes through *A* that is parallel to *m*.	

lesson, type	statement	diagram
U1, L12 theorem	Translations take lines to parallel lines or to themselves.	 $m \parallel m'$
U1, L14 definition	**Rotation** is a rigid transformation that takes a point to another point on the circle through the original point with the given center. The two radii to the original point and the image make the given angle. "Rotate _(object)_ (clockwise or counterclockwise) by _(angle or angle measure)_ using center _(point)_."	 Rotate P counterclockwise by $a°$ using center C.
U2, L1 theorem	If two figures are congruent, then **corresponding** parts of those figures must be congruent	 $\triangle PQR \cong \triangle DEF$ so $PQ=DE$, $PR=DF$, $QR=EF$, $\angle P \cong \angle D$, $\angle Q \cong \angle E$, $\angle R \cong \angle F$
U2, L3 theorem	If all pairs of corresponding sides and all pairs of corresponding angles are congruent, then the triangles must be congruent.	 $AB=DE$, $BC=EF$, $CA=FD$, $\angle B \cong \angle E$, $\angle A \cong \angle D$, $\angle C \cong \angle F$ so $\triangle ABC \cong \triangle DEF$
U2, L5 theorem	If two segments have the same length, then they are congruent.	 $AB = CD$ so, $\overline{AB} \cong \overline{CD}$

lesson, type	statement	diagram
U2, L6 theorem	**Side-Angle-Side Triangle Congruence Theorem:** In two triangles, if two pairs of congruent corresponding sides and the pair of corresponding angles between the sides are congruent, then the two triangles are congruent.	 *AB=GB*, *BC=BC*, $\angle ABC \cong \angle GBC$ so $\triangle ABC \cong \triangle GBC$
U2, L6 theorem	**Isosceles Triangle Theorem:** In an isosceles triangle, the base angles are congruent.	 *AP=PB* so $\angle A \cong \angle B$
U2, L7 theorem	**Angle-Side-Angle Triangle Congruence Theorem:** In two triangles, if two pairs of corresponding angles, and the pair of corresponding sides between the angles are congruent, then the triangles must be congruent.	 $\angle A \cong \angle C$, *AE=EC*, $\angle DEA \cong \angle BEC$, so $\triangle DEA \cong \triangle BEC$
U2, L7 definition	A **parallelogram** is a quadrilateral with two pairs of opposite sides parallel.	 *NM* // *KL*, *NK* // *ML*, so *MNKL* is a parallelogram
U2, L7 theorem	In a parallelogram, pairs of opposite sides are congruent.	 *MNKL* is a parallelogram, so *NM=KL*, *NK=ML*

lesson, type	statement	diagram
U2, L8 theorem	If a point C is the same distance from A as it is from B, then C must be on the perpendicular bisector of AB.	 $AC=BC$, M is the midpoint, so $MC \perp AB$
U2, L8 theorem	If C is a point on the perpendicular bisector of segment AB, the distance from C to A is the same as the distance from C to B.	 $AB \perp CM$, $AM=BM$, so $AC=BC$
U2, L9 theorem	**Side-Side-Side Triangle Congruence Theorem:** In two triangles, if all three pairs of corresponding sides are congruent, then the triangles must be congruent.	 $HU=HJ$, $UG=JG$, $HG=HG$ so $\triangle HUG \cong \triangle HJG$
U2, L9 theorem	In a parallelogram, opposite angles are congruent.	 $ABCD$ is a parallelogram, so $\angle A \cong \angle C$, $\angle D \cong \angle B$

lesson, type	statement	diagram
U5, L2 definition	A **dilation** is a transformation in which each point on a figure moves along a line and changes its distance from a fixed point, called the "center of dilation." All of the original distances are multiplied by the same scale factor.	
U5, L4 definition	The **point-slope form** of the equation of a line is $y - k = m(x - h)$ where (h, k) is a particular point on the line and m is the slope of the line.	
U5, L5 theorem	Lines are parallel if and only if they have equal slopes.	
U5, L6 theorem	Lines are perpendicular if and only if their slopes are opposite reciprocals.	