

Basic Geometry Chapter 3			
	October 9-13	October 16-20	October 23-27
Monday	No School – Native American Day!	Objective: 3.4 Parallel Lines and Transversals Assignment: 3.4 Worksheet	*Ms. Blaseg Gone* Objective: Use Properties of Parallel Lines Assignment: Angle Maze Worksheets (3)
Tuesday	Objective: 3.1 Relationships Between Lines Assignment: 3.1 Worksheet	Objective: Identify Angle Pairs and Use Properties of Parallel Lines Assignment: Parallel Lines Scavenger Hunt	Objective: 3.7 Translations Assignment: 3.7 Worksheet
Wednesday	Objective: 3.2 Theorems About Perpendicular Lines Assignment: 3.2 Worksheet	Objective: 3.5 Showing Lines are Parallel Assignment: 3.5 Worksheet	*Early Release* Objective: Chapter 3 Review Assignment: Chapter 3 Review
Thursday	Objective: 3.3 Angles Formed by Transversals Assignment: Coloring Activity 3.3 Worksheet	Objective: 3.6 Using Perpendicular and Parallel Lines Assignment: 3.6 Worksheet	Objective: Chapter 3 Review Assignment: Chapter 3 Review
Friday	Objective: Quiz 3.1-3.3 Assignment: None	Objective: Quiz 3.4-4.6 Assignment: None *End of Quarter 1*	Objective: Chapter 3 Test Assignment: None

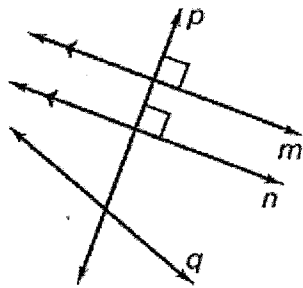
3.1 Relationships Between Lines

Goal: Identify relationships between lines

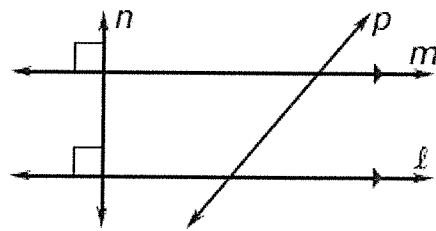
Vocab Word	Picture	Symbols
Parallel lines: two lines that lie in the same plane and do not intersect		$p \parallel q$
Perpendicular lines: two lines that intersect to form a right angle		$m \perp n$
Skew lines: two lines that do NOT lie in the same plane and do NOT intersect		Skew lines $\overleftrightarrow{EF} + \overleftrightarrow{AC}$ $\overleftrightarrow{BD} + \overleftrightarrow{CG}$
Parallel planes: two planes that do not intersect		\parallel planes plane ABF + plane CGD plane ACG + plane BDH

lots of examples

Determine whether the lines are parallel, perpendicular, or neither.



- a) n and m \parallel
- b) p and q neither
- c) n and p \perp
- d) p and m \perp
- e) n and q neither

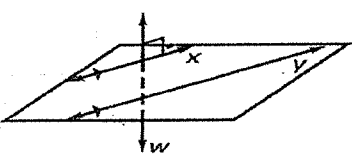


- a) l and m \parallel
- b) m and n \perp
- c) n and p neither
- d) l and n \perp
- e) l and p neither

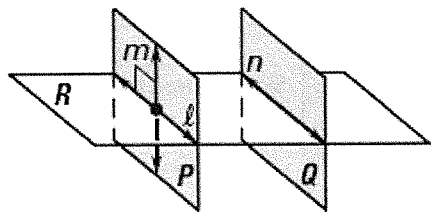
1. Name a pair of parallel lines.
line $x \parallel$ line y

2. Name a pair of perpendicular lines.
line $x \perp$ line w

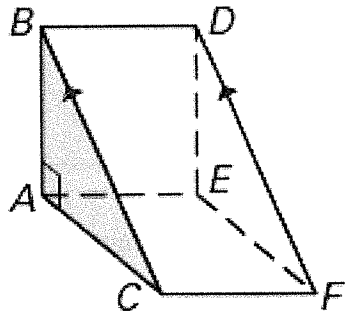
3. Name a pair of skew lines.
line w & line y



- a) Name a plane that appears parallel to plane P. plane Q
- b) Name a line that is perpendicular to plane R. plane P
- c) Name a line that is skew to line m. line n



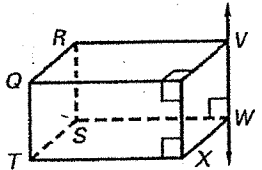
- a) Name a plane that appears parallel to plane ABC. plane DEF
- b) Name a plane that appears ^{perpendicular} parallel to plane ABC. plane ACF or BAE
- c) Name a line that is perpendicular to plane ABD. \overleftrightarrow{AC}
- d) Name a line that is perpendicular to plane AEC. \overleftrightarrow{AB}
- e) Name a line that is skew to \overleftrightarrow{BC} . \overleftrightarrow{DE} \overleftrightarrow{AE} \overleftrightarrow{EF}
- f) Name a line that is parallel to \overleftrightarrow{BC} . \overleftrightarrow{DF}



4. Name a line that is skew to \overleftrightarrow{VW} .
 \overleftrightarrow{QR} \overleftrightarrow{QT} \overleftrightarrow{XT} \overleftrightarrow{TS}

5. Name a plane that appears parallel to plane VXW.
plane RST

6. Name a line that is perpendicular to plane VXW.
 \overleftrightarrow{SW}



3.2 Theorems About Perpendicular Lines

Goal: Use theorems about perpendicular lines.

Theorem	Picture	Symbols
All right angles are <u>congruent</u>		If $m\angle A = 90^\circ$ and $m\angle B = 90^\circ$, then $\angle A \cong \angle B$
If two lines are perpendicular, then they intersect to form <u>4</u> right angles		If $n \perp m$, then $m\angle 1 = 90^\circ$, $m\angle 2 = 90^\circ$, $m\angle 3 = 90^\circ$, $m\angle 4 = 90^\circ$

In the diagram, $r \perp s$ and $r \perp t$. Decide whether enough information is given to conclude that the statement is true.

a) $\angle 1 \cong \angle 5$ Enough info? Yes

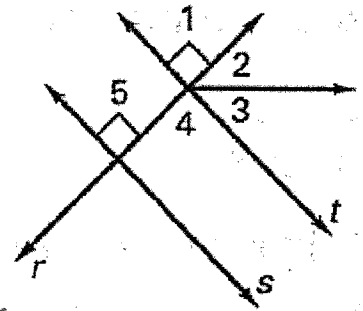
Explain: Both are right angles

b) $\angle 4 \cong \angle 5$ Enough info? Yes

Explain: $t \perp r$ so $\angle 4$ is a right angle

c) $\angle 2 \cong \angle 3$ Enough info? NO

Explain: $\angle 2$ & $\angle 3$ are not marked as congruent \angle 's



a) $\angle 6 \cong \angle 10$ Enough info? Yes

Explain: Both are marked as right \angle 's

b) $\angle 7 \cong \angle 10$ Enough info? Yes

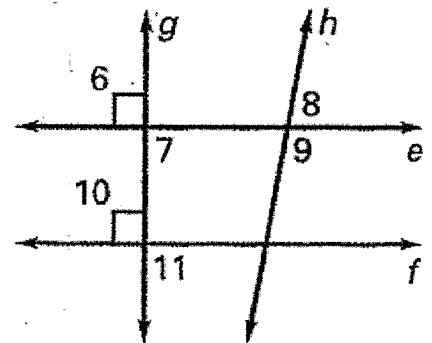
Explain: $\angle 7$ is a right angle because $g \perp t$

c) $\angle 6 \cong \angle 8$ Enough info? NO

Explain: $\angle 8$ is not marked as a right angle

d) $\angle 7 \cong \angle 11$ Enough info? Yes

Explain: Both are right \angle 's because $g \perp e$ & $f \perp g$

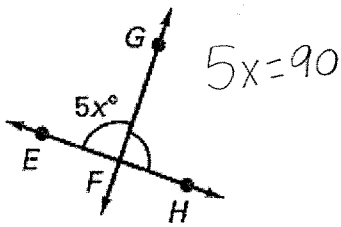


Theorem	Picture	Symbols
If two lines intersect to form adjacent congruent angles, then the lines are <u>perpendicular</u>		If $\angle 1 \cong \angle 2$ then $\overrightarrow{AC} \perp \overrightarrow{BD}$
If two sides of adjacent acute angles are perpendicular, then the angles are <u>complementary</u>		If then $\overrightarrow{EF} \perp \overrightarrow{EH}$, then $m\angle 3 + m\angle 4 = \underline{90^\circ}$

Find the value of the variable.

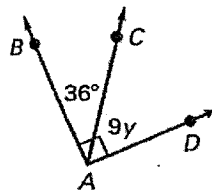
a) $x = \underline{18}$

$\angle EFG \cong \angle HFG$



b) $y = \underline{6}$

$\overrightarrow{AB} \perp \overrightarrow{AD}$

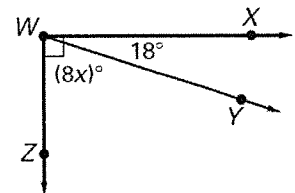


$36 + 9y = 90$

$9y = 54$

c) $x = \underline{9}$

$\overrightarrow{WX} \perp \overrightarrow{WZ}$

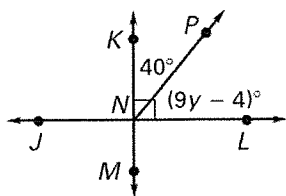


$8x + 18 = 90$

$8x = 72$

d) $y = \underline{6}$

$\overrightarrow{JL} \perp \overrightarrow{KM}$

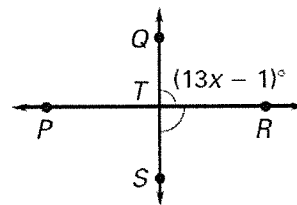


$40 + 9y - 4 = 90$

$9y = 54$

e) $x = \underline{7}$

$\angle QTR \cong \angle RTS$

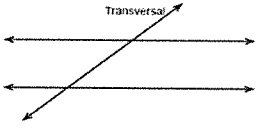
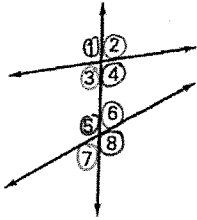
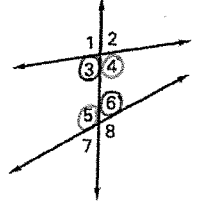
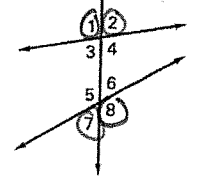
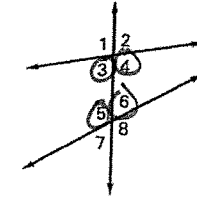


$13x - 1 = 90$

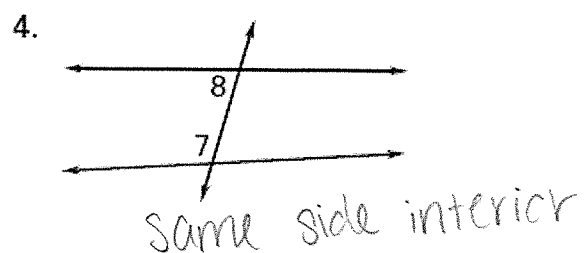
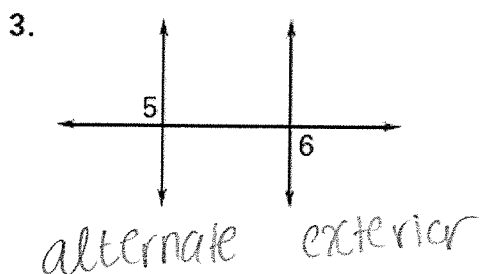
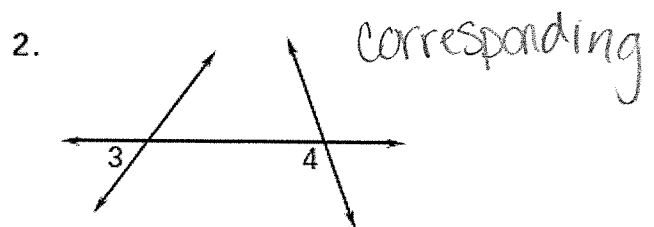
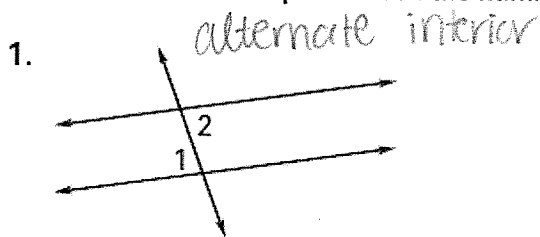
$13x = 91$

3.3 Angles Formed by Transversals

Goal: Identify angles formed by transversals

<p>Transversal: a line that <u>intersects</u> two or more coplanar lines at different points.</p>		
Angle Pairs Formed by Transversals		
<p>Corresponding Angles: occupy corresponding <u>positions</u></p>		<p>$\angle 1$ & $\angle 5$ $\angle 3$ & $\angle 7$ $\angle 2$ & $\angle 6$ $\angle 4$ & $\angle 8$</p>
<p>Alternate Interior Angles: lie <u>between</u> the two lines on <u>opposite</u> sides of the transversal</p>		<p>$\angle 3$ & $\angle 6$ $\angle 5$ & $\angle 4$</p>
<p>Alternate Exterior Angles: lie <u>outside</u> the two lines on <u>opposite</u> sides of the transversal</p>		<p>$\angle 1$ & $\angle 8$ $\angle 2$ & $\angle 7$</p>
<p>Same-side Interior Angles: lie <u>between</u> the two lines on <u>the same</u> sides of the transversal</p>		<p>$\angle 3$ & $\angle 5$ $\angle 4$ & $\angle 6$</p>

Describe the relationships between the numbers angles.



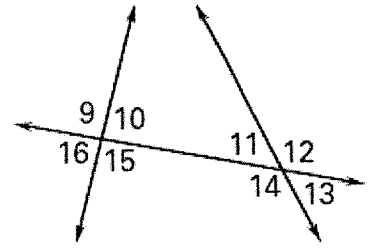
List all pairs that fit the description.

Alternate Exterior: $\angle 9$ & $\angle 13$, $\angle 12$ & $\angle 16$

Alternate Interior: $\angle 10$ & $\angle 14$, $\angle 11$ & $\angle 15$

Corresponding: $\angle 9$ & $\angle 11$, $\angle 10$ & $\angle 12$, $\angle 15$ & $\angle 13$

Same Side Interior: $\angle 10$ & $\angle 11$, $\angle 14$ & $\angle 15$



Describe the relationship between the angles below.

a) $\angle 6$ and $\angle 4$ are same side interior angles.

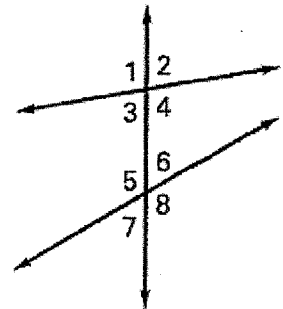
b) $\angle 1$ and $\angle 5$ are corresponding angles.

c) $\angle 2$ and $\angle 6$ are corresponding angles.

d) $\angle 4$ and $\angle 5$ are alternate interior angles.

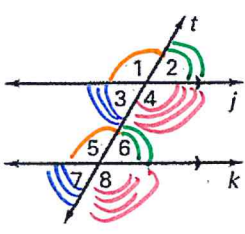
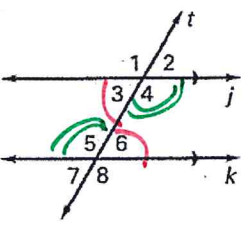
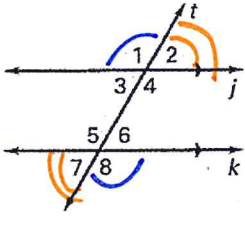
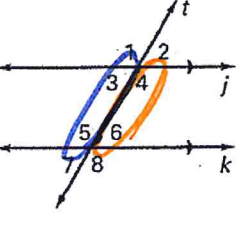
e) $\angle 6$ and $\angle 3$ are alternate interior angles.

f) $\angle 1$ and $\angle 8$ are alternate exterior angles.



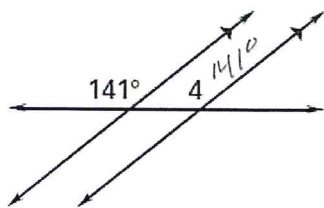
3.4 Parallel Lines and Transversals

Goal: Find the congruent angles formed when a transversal cuts parallel lines

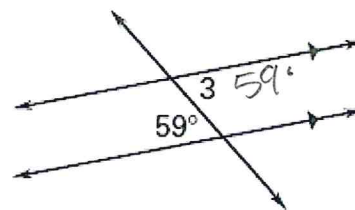
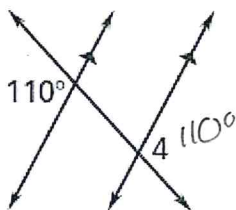
<p>Corresponding Angles Postulate: if two parallel lines are cut by a transversal, then corresponding angles are</p> <p><u>congruent</u></p>		<p>If $j \parallel k$, then...</p> <p>$\angle 1 \cong \angle 5$ $\angle 2 \cong \angle 6$ $\angle 3 \cong \angle 7$ $\angle 4 \cong \angle 8$</p>
<p>Alternate Interior Angles Theorem: if two parallel lines are cut by a transversal, then alternate interior angles are</p> <p><u>congruent</u></p>		<p>If $j \parallel k$, then...</p> <p>$\angle 3 \cong \angle 6$ $\angle 4 \cong \angle 5$</p>
<p>Alternate Exterior Angles Theorem: if two parallel lines are cut by a transversal, then alternate exterior angles are</p> <p><u>congruent</u></p>		<p>If $j \parallel k$, then...</p> <p>$\angle 1 \cong \angle 8$ $\angle 2 \cong \angle 7$</p>
<p>Same Side Interior Angles Theorem: if two parallel lines are cut by a transversal, then same side interior angles are</p> <p><u>supplementary</u></p>		<p>If $j \parallel k$, then...</p> <p>$m\angle 4 + m\angle 6 = 180^\circ$ $m\angle 3 + m\angle 5 = 180^\circ$</p>

Identify the angle pair and then find the measure of the numbered angle.

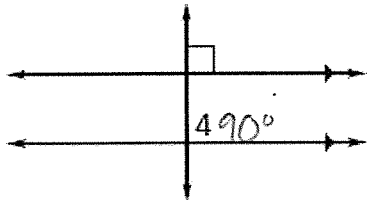
a) Type: corresponding



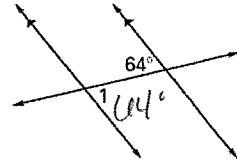
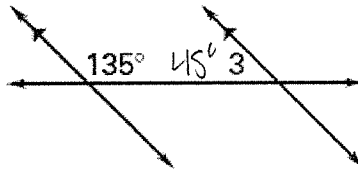
b) Type: alt. exterior c) Type: Alt. Int.



d) Type: corresponding



e) Type: same side int. f) Type: alt. interior



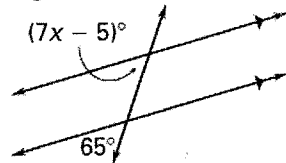
Identify the type of angle pair and then find the value of the variable.

a) Type: corresponding

$x = \underline{10}$

$$7x - 5 = 69$$

$$7x = 70$$

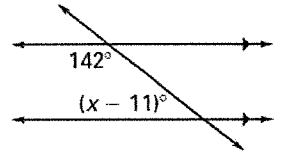


b) Type: same side interior

$x = \underline{49}$

$$142 + x - 11 = 180$$

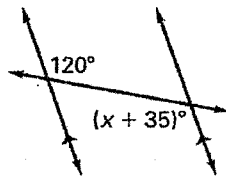
$$x + 131 = 180$$



c) Type: alt. interior

$x = \underline{85}$

$$120 = x + 35$$

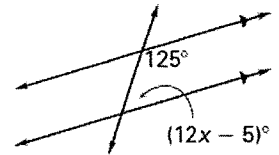


d) Type: same side interior

$x = \underline{5}$

$$125 + 12x - 5 = 180$$

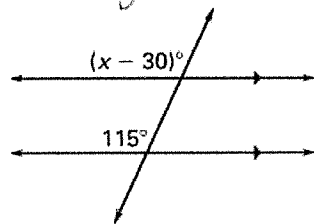
$$12x = 60$$



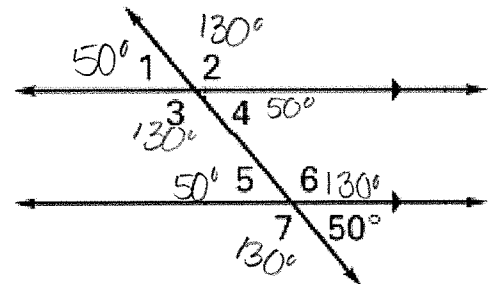
e) Type: corresponding

$x = \underline{145}$

$$x - 30 = 115$$



Find the measure of each angle.



3.5 Showing Lines are Parallel

Goal: Show that two lines are parallel.

Converse: the converse of an if-then statement is the statement formed by switching the

hypothesis and the conclusion

Identify the hypothesis by underlining once and the conclusion by underlining twice for each conditional. Then write the converse of each statement.

a) If I am in geometry, then Ms. Blaseg is my teacher.

Converse: If Ms. Blaseg is my teacher, then I am in geometry

b) If today is Thanksgiving, then today is Thursday.

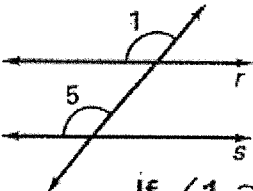
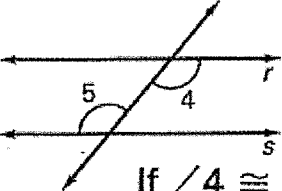
Converse: If today is Thursday, then today is Thanksgiving.

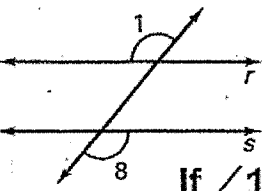
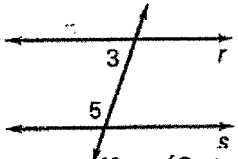
c) If two segments are congruent, then the two segments have the same length.

Converse: If two segments have the same length, then the two segments are congruent.

d) If two lines are parallel, then they do not intersect.

Converse: If two lines do not intersect, then they are parallel

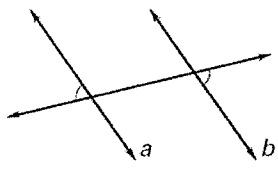
<p>Corresponding Angle Converse: If corresponding angles are congruent, then the lines are <u>parallel</u></p>	 <p>If $\angle 1 \cong \angle 5$, then $r \parallel s$.</p>
<p>Alternate Interior Angle Converse: If alternative interior angles are congruent, then the lines are <u>parallel</u></p>	 <p>If $\angle 4 \cong \angle 5$, then $r \parallel s$.</p>

<p>Alternate Exterior Angle Converse: If alternative exterior angles are congruent, then the lines are <u>parallel</u></p>	 <p>If $\angle 1 \cong \angle 8$, then $r \parallel s$.</p>
<p>Same Side Interior Angles Converse: If same-side interior angles are supplementary, then the lines are <u>parallel</u></p>	 <p>If $m\angle 3 + m\angle 5 = 180^\circ$, then $r \parallel s$.</p>

Determine whether enough information is given to conclude that $a \parallel b$. Explain.

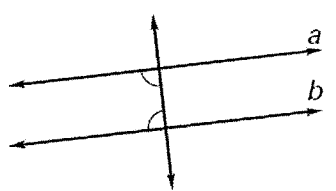
a) Parallel? Yes

Explain:
Alt. Exterior
 \angle 's Converse



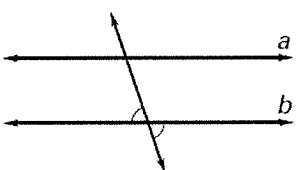
b) Parallel? No

Explain:
Not enough info



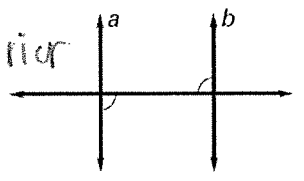
c) Parallel? No

Explain:
The \angle 's are
vertical \angle 's so
not enough info



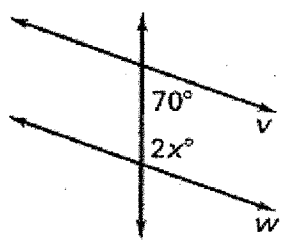
d) Parallel? Yes

Explain:
Alternate Interior
 \angle 's Converse



Find the value of x so that $v \parallel w$.

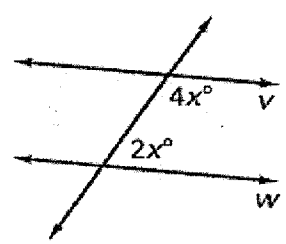
a) $x = 55$



$$70 + 2x = 180$$

$$2x = 110$$

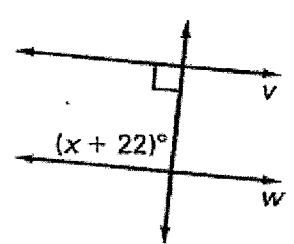
b) $x = 30$



$$4x + 2x = 180$$

$$6x = 180$$

c) $x = 68$

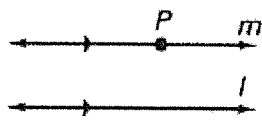
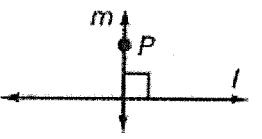
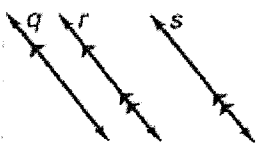
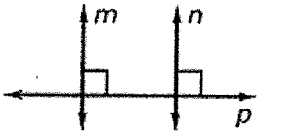


$$90 + x + 22 = 180$$

$$112 + x = 180$$

3.6 Using Perpendicular and Parallel Lines

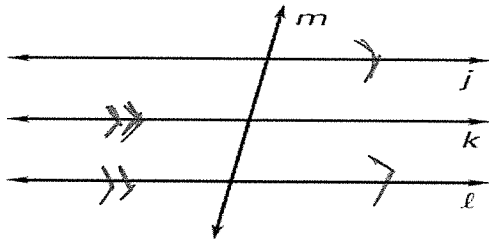
Goal: Use properties of parallel and perpendicular lines.

<p>Parallel Postulate: If there is a line and a point not on a line, then there is exactly one line through the point <u>parallel</u> to the given line.</p>		<p>If P is not on l, then there exists a line m through P such that <u>$m \parallel l$</u></p>
<p>Perpendicular Postulate: If there is a line and a point not on a line, then there is exactly one line through the point <u>perpendicular</u> to the given line.</p>		<p>If P is not on l, then there exists a line m through P such that <u>$m \perp l$</u></p>
<p>Theorem 3.11: If two lines are <u>parallel</u> to the same line, then they are parallel to each other.</p>		<p>If $g \parallel r$ and $r \parallel s$, then <u>$g \parallel s$</u></p>
<p>Theorem 3.12: If two lines are <u>perpendicular</u> to the same line, then they are parallel to each other</p>		<p>If $m \perp p$ and $n \perp p$, then <u>$m \parallel n$</u></p>

State the postulate or theorem that allows you to conclude that $j \parallel k$.

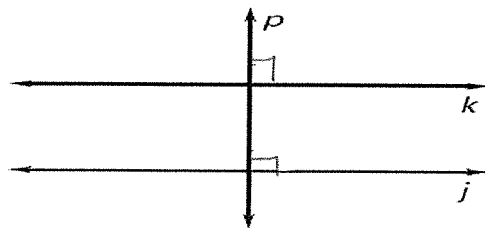
a) Theorem 3.11

$j \parallel l, k \parallel l$



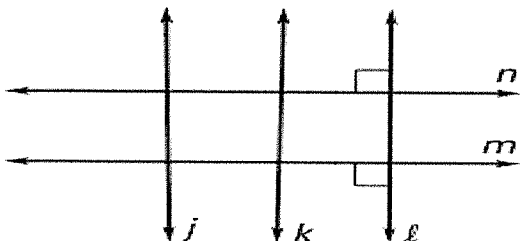
b) Theorem 3.12

$j \perp p, k \perp p$

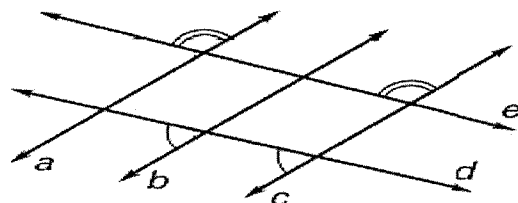


Determine which lines must be parallel.

a) $m \parallel n$

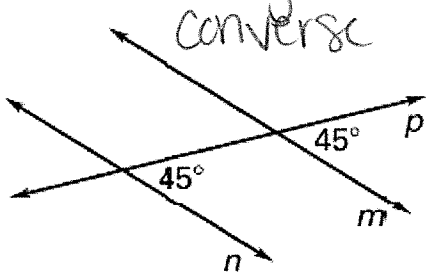


b) all b $b \parallel c$ $a \parallel c$

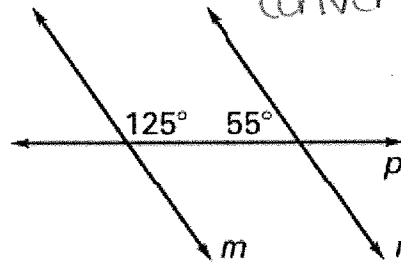


Explain how you would show that $m \parallel n$. State any postulates or theorems you might use.

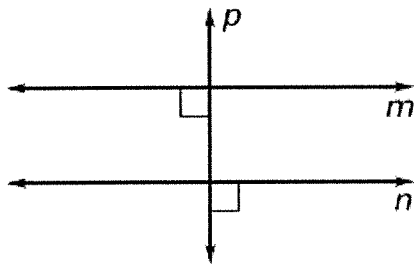
a) Corresponding \angle 's



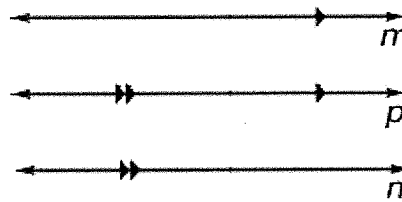
b) same side interior \angle 's



c) Theorem 3.12

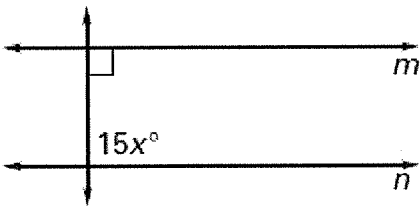


d) Theorem 3.11

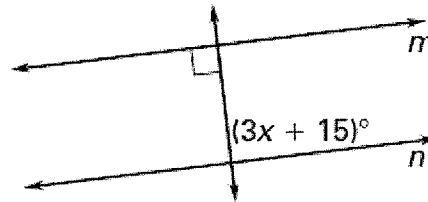


Find the value of x that makes the lines parallel.

a) $x = \underline{6}$ $90 = 15x$



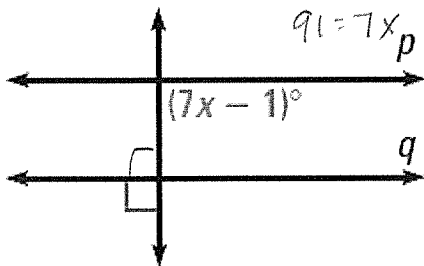
b) $x = \underline{25}$ $90 = 3x + 15$
 $75 = 3x$



c) $x = \underline{13}$

$$90 = 7x - 1$$

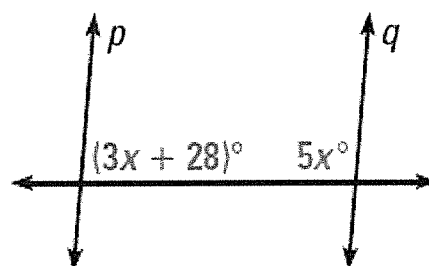
$$91 = 7x$$



d) $x = \underline{19}$

$$3x + 28 + 5x = 180$$

$$8x = 152$$



3.7 Translations


Goal: Identify and use translations.

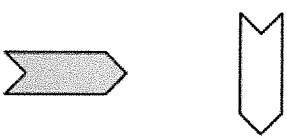
Transformation: an operation that maps, or moves, a figure onto an image

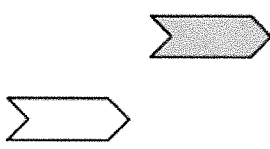
Translation: a transformation that slides each point of a figure the same distance in the same direction

Image: the new figure that results from the transformation

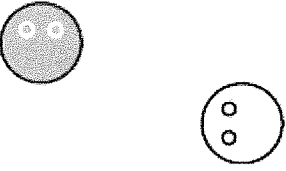
Decide whether the white figure is a translation of the shaded figure.

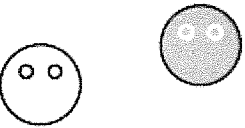
1.  NO


2.  NO

3.  Yes

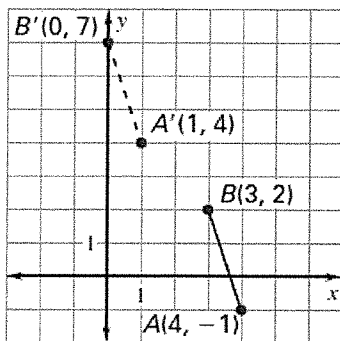
Decide whether the white figure is a translation of the shaded figure.

a.  No

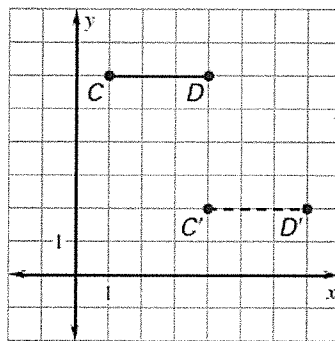
b.  Yes

c.  No

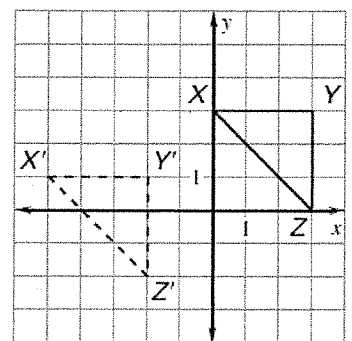
Describe the translation of the figure.



left 3, up 5



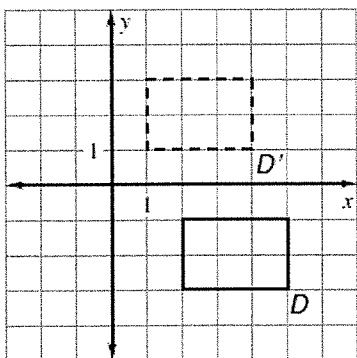
right 3
down 4



left 5
down 2

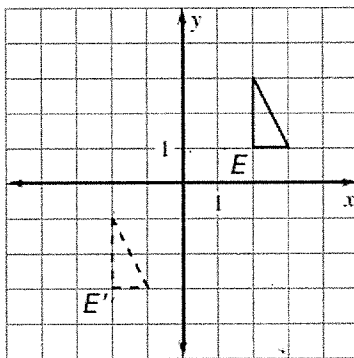
Describe the translation using coordinate notation.

a) $(x, y) \rightarrow (x-1, y+2)$



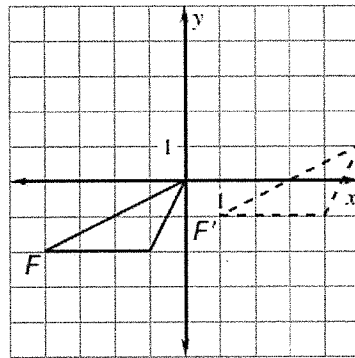
left 1
up 2

b) $(x, y) \rightarrow (x-4, y-4)$



left 4
down 4

c) $(x, y) \rightarrow (x+5, y+1)$



right 5
up 1

Find the image of the point using the translation: $(x, y) \rightarrow (x+5, y-3)$

a) A (3, 2)

A'(8, -1)

$(3+5, 2-3)$

b) B (-4, 5)

B'(1, 2)

$(-4+5, 5-3)$

c) C (-1, -3)

C'(4, -6)

$(-1+5, -3-3)$

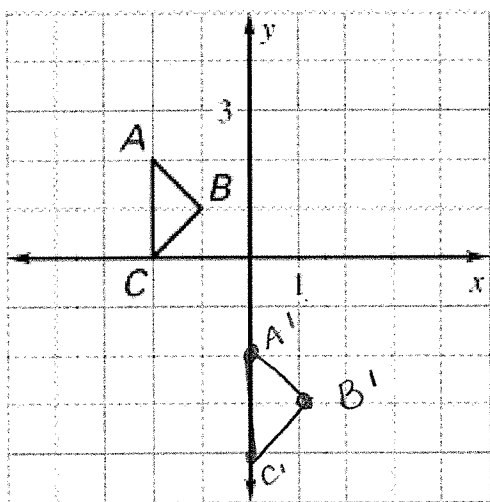
d) D (-5, 3)

D'(0, 0)

$(-5+5, 3-3)$

Draw the image of the figure after the given translation. Be sure to label all coordinates.

right 2 down 4
 $(x, y) \rightarrow (x+2, y-4)$



left 3 down 2
 $(x, y) \rightarrow (x-3, y-2)$

