

Unit 5 Parallel and Perpendicular Lines

Target 5.1: Classify and identify angles formed by parallel lines and transversals

5.1a – Parallel and Perpendicular lines

5.1b – Parallel Lines and its Angle Relationships

Target 5.2: Apply and prove statements using perpendicularity theorems

5.2a – Prove Theorems about Perpendicular Lines

5.2b – Constructions: Perpendicular and Parallel Lines

<https://goo.gl/FVVPRc>










Target 5.3: Use parallel and perpendicular lines to write linear equations and to determine the distance between a point and a line

5.3a – Determine Whether Lines are Parallel or Perpendicular Using Linear Equations

5.3b – Determine Whether Lines are Parallel or Perpendicular Using Linear Equations

Target 5.4: Use angle properties in triangles to determine unknown angle measurements

5.4: Parallel Lines and Triangles

Date	Target	Assignment to be Completed Before Class	Video?	In Class Assignment	Done?
M 11-16	5.1a	5.1a Video		5.1a Worksheet	
T 11-17	5.1b	5.1b Video		5.1b Worksheet	
W 11-18	5.2a	5.2a Video		5.2a Worksheet	
R 11-19	5.2b	5.2b Video		5.2b Worksheet	
F 11-20	5.3a	5.3a Video		5.3a Worksheet	
M 11-23	5.3b	5.3b Video		5.3b Worksheet	
T 11-24	Review			5.1 – 5.3 Review	
W 11-25	Quiz			Quiz 5.1 – 5.3	
M 11-30	5.4	5.4 Video		5.4 Worksheet	
T 12-1	Quiz			Quiz 5.4	
W 12-2	Review			Unit 5 Review	
R 12-3	Test			Unit 5 Test	

NAME: _____

5.1a – Draw and Classify Angles formed by Transversals

Target 1: Classify and find measures of angles formed by parallel lines and transversals

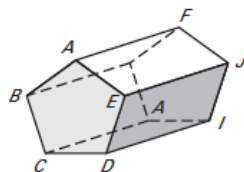
Vocabulary:

Parallel Lines: _____

Example 1: Identify relationship in space

Think of each segment in the figure as part of a line. Which line(s) or plane(s) in the figure appear to fit the description?

a) Line(s) parallel to \overleftrightarrow{AF} and containing point E.



b) Plane(s) parallel to plane FGJ and containing point E.

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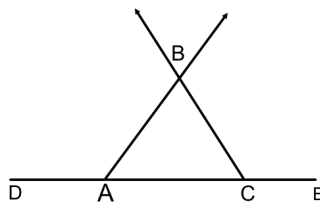
What is a way you can tell that lines are parallel in a diagram?

Drawing with your teacher!

Drawing with your teacher!	

Example 2: Identify angle relationships

Identify the special angle pairs in the diagram



a) **Corresponding Angles**

b) **Alternative Interior Angles**

c) **Alternate Exterior Angles**

d) **Consecutive Interior Angles**

YOU TRY NOW!

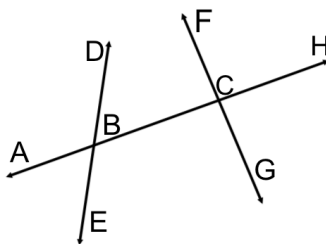
1) Identify special angle pair relationships in the diagram

a) **Corresponding Angles**

b) **Alternative Interior Angles**

c) **Alternate Exterior Angles**

d) **Consecutive Interior Angles**



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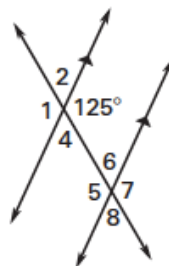
*Were you able to identify all of the angle pairs **WITHOUT** looking at the answers first?*

5.1b – Use Parallel Line and Transversals**Target 1: Classify and find measures of angles formed by parallel lines and transversals**

Congruent Angle Pairs	Supplementary Angle Pairs
<i>If _____ are intersected by a transversal, then...</i>	
<i>Corresponding Angles are Congruent</i>	<i>Consecutive Interior Angles are Supplementary</i>
<i>Alternate Interior Angles are Congruent</i>	
<i>Alternate Exterior Angles are Congruent</i>	

Example 1: Identify Congruent Angles

The measure of three of the number angles is 125° . Identify those angles. For each pair of angles, identify which angles are congruent and explain why.



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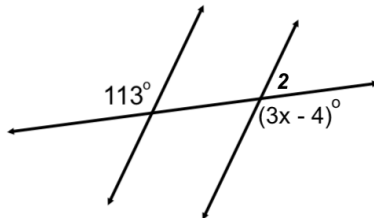
What do supplementary angles add up to?

What does congruent mean?

Which angles are supplementary?

Example 2: Use properties of parallel lines

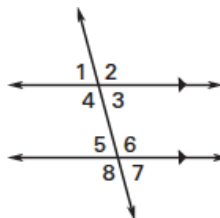
Find the value of x , then find the measure of angle 2.



YOU TRY NOW!

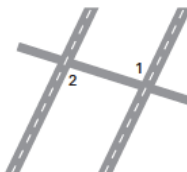
1) If the $m\angle 7 = 75^\circ$, what other angles are congruent to $\angle 7$? Explain how you know.

Congruent Angles:

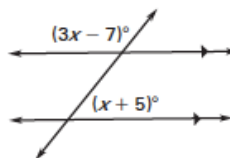


Explanation:

2) A taxiway is being constructed that intersects two parallel runways at an airport. You know that $m\angle 2 = 98^\circ$. What is $m\angle 1$? How do you know?



3) Find the value of x and explain your reasoning for your initial equation.



Annotate Here

Name all vertical angles in the diagram.

5.2a – Prove Theorems about Perpendicular Lines
Target 2: Apply and prove statements using perpendicularity theorems

Vocabulary/Concept

**Draw a horizontal line below and draw a smiley face somewhere above the line.
 How would you calculate the shortest distance from the smile face to the line?**

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**What symbol would you see that
 IMMEDIATELY indicates that two
 lines are intersecting?**

Angles Formed with Perpendicular lines

Linear Pairs of Congruent Angles

If two lines intersect to form a _____ of congruent angles, then _____.

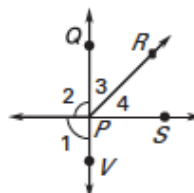
Apply and prove statements using perpendicularity theorems

Perpendicular Lines and Right Angles Theorem

If two lines are perpendicular, then _____.

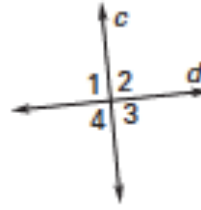
Example 1: Explain how you know that angles have specific properties

In the diagram, $\angle 1 \cong \angle 2$. Prove that $\angle 3$ and $\angle 4$ are complementary using complete sentences.

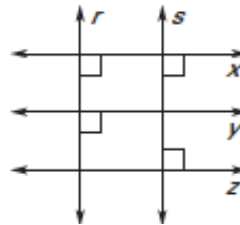


YOU TRY NOW!

1) If $c \perp d$, what do you know about the sum of the measure of $\angle 3$ and $\angle 4$? Answer in complete sentences



2) Determine which lines, if any, must be parallel in the diagram. Explain



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5.2b – Constructions: Perpendicular and Parallel Lines
Target 2: Apply and prove statements using perpendicularity theorems

Constructions of Perpendicular lines

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Example 1: Construct a perpendicular line from a point on line

Video: "The perpendicular from a point on a line"



Example 2: Construct a perpendicular line to the original line and that passes through a given point not on the line.

Video: "Geometry – Construction 4 – Perpendicular to Line Through Point Not on Line"

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Constructions of Parallel Lines

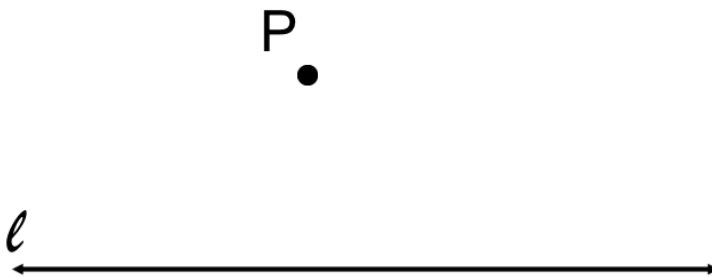
Example 3: Construct a line parallel to a given line

Video: "Constructing Parallel Lines (using a straightedge and a compass)"



Example 4: Construct a line parallel to a given line through a specific point

Video: "Constructing Parallel Line Through a Given Point 128-2.21"



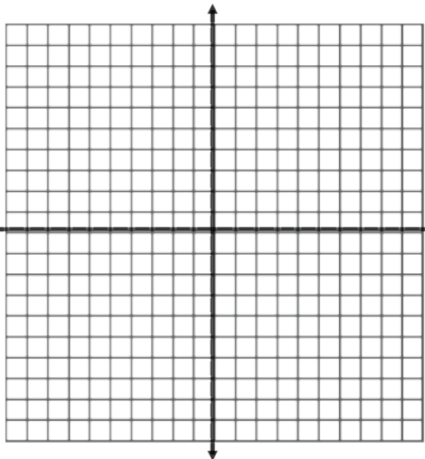
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5.3a – Determine Whether Lines are Parallel or Perpendicular Using Linear Equations

Target 3: Use parallel and perpendicular lines to write linear equations and to determine the distance between a point and a line

Parallel Lines

If two NONVERTICAL lines have the same _____, then the lines are _____.



Given Line: $y = -3x + 1$

Line 1:

Line 2:

Annotate Here

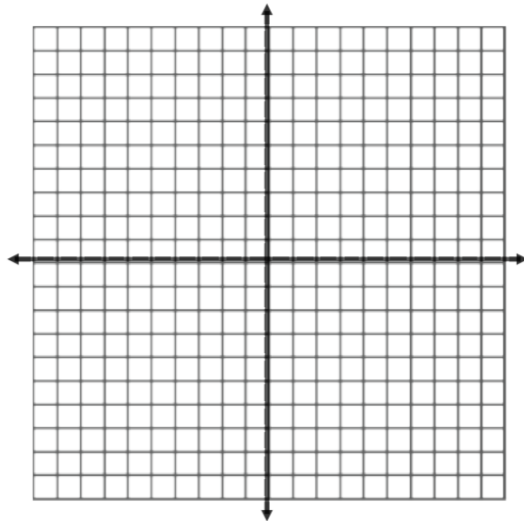
Example 1: Write an equation of a parallel line

Write an equation of the line that passes through (2, 4) AND is parallel to the line $y = 4x + 1$.

Perpendicular Lines

If two NONVERTICAL lines have the slopes that are _____, then the lines are _____.

****opposite reciprocal example**



Given Line: $y = -\frac{2}{3}x - 2$

Line 1:

Line 2:

Example 2: Determine parallel or perpendicular lines

Determine which lines of the following lines, IF ANY, are parallel or perpendicular:

Line a: $12x - 3y = 3$

Line b: $y = 4x + 2$

Line c: $4y + x = 8$

YOU TRY NOW!

1) Write an equation of the line that passes through (-4, 6) and is parallel to the line

$y = -3x + 2$

2) Determine which of the following lines, if any, are parallel or perpendicular.

Line a: $4x + y = 2$

Line b: $5y + 20x = 10$

Line c: $8y = 2x + 8$

Annotate Here

YOU TRY NOW! (cont)

3) Write an equation of a perpendicular line

Write an equation of the line that passes through (-3, 4) and is perpendicular to the line $y = \frac{1}{3}x + 2$.

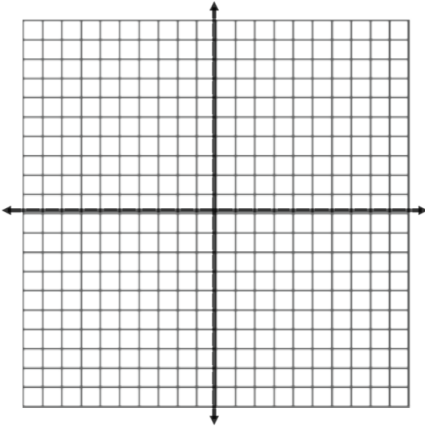
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5.3b – Determine Whether Lines are Parallel or Perpendicular Using Linear Equations**Target 3: Use parallel and perpendicular lines to write linear equations and to determine the distance between a point and a line**

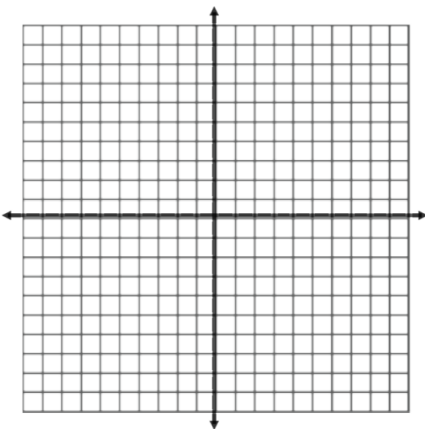
VIDEO: “MPM2D-2.1- Finding Distance Between a Point and a Line”

Example 1: Calculate the shortest distance between point $A(6, 5)$ and the line

$$y = 2x + 3.$$

Annotate Here***YOU TRY NOW!*****Calculate the shortest distance between point $A(1, 5)$ and the line**

$$y = -5x - 2.$$



5.4 – Parallel Lines and Triangles

Target 4: Use angle properties in triangles to determine unknown angle measurements

Vocabulary

Triangle: _____

Interior Angles: _____

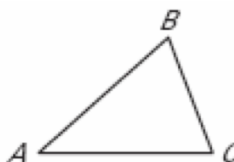
Exterior Angles: _____

Annotate Here

Triangle Sum Theorem

The sum of the measures of the interior angles of a triangle is _____.

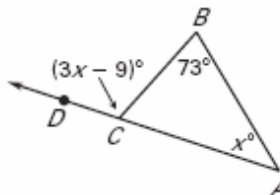
$$m\angle A + m\angle B + m\angle C =$$



Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the SUM of the measures of the two _____ angles.

Example 1: Find the measure of $\angle DCB$.



YOU TRY NOW!

Find the measure of $\angle 1$ in the diagram shown.

