Slope (m)

$\frac{y_2 - y_1}{x_2 - x_1}$

Find the slope of the line passing through the given point.

(2, 4), (4, -4) (-6, 2), (4, -2) (-1, -1), (-3, -6)

(3, 6), (3, 8) (4, 1), (6, 1) (1, 5), (5, 2)

Parallel Lines

Lines that have the same slope

State whether the lines are *parallel*, *perpendicular*, or *neither*.

Line 1 passes through (1, 5) and (-4, -2)
Line 2 passes through (3, 0) and (-2, -7)

Line 1 = $\frac{-2-5}{-4-1} = \frac{-7}{-5} = \frac{7}{5}$ Line 2 = $\frac{-7-0}{-2-3} = \frac{-7}{-5} = \frac{7}{5}$

Line 1 || line 2

Perpendicular Lines

Slopes are the opposite reciprocal of each other

$\frac{a}{b}$ $-\frac{b}{a}$

$\frac{0}{5}$

Line 1 passes through (2, -2) and (-2, 7)
Line 2 passes through (4, -5) and (5, 1)

Line 1 = $\frac{7-(-2)}{-2-2} = \frac{9}{-4}$ Line 2 = $\frac{1-(-5)}{5-4} = \frac{6}{1}$

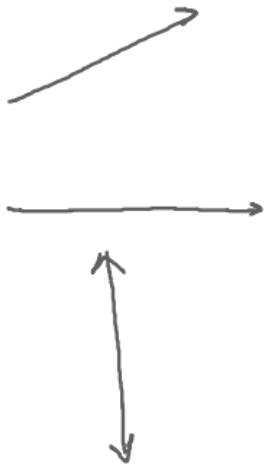
Neither

Line 1 passes through (3, 6) and (2, -1)
Line 2 passes through (-1, 2) and (6, 1)

Line 1 = $\frac{-1-6}{2-3} = \frac{-7}{-1}$ $= \frac{7}{1}$

Line 2 = $\frac{1-2}{6-(-1)} = \frac{-1}{7}$ =

perpendicular



Line 1 passes through (9, 0) and (3, 4)
Line 2 passes through (-5, 6) and (4, 0)

Line 1 $= \frac{4-0}{3-9}$

$= \frac{4}{-6}$

$= -\frac{2}{3}$

Line 2 $= \frac{0-6}{4-(-5)} =$

$= \frac{-6}{9} = -\frac{2}{3}$

Parallel

Line 1 passes through (3, 8) and (3, -10)
Line 2 passes through (6, -2) and (6, 12)

Line 1 $= \frac{-10-8}{3-3}$

$= \frac{-18}{0}$

undefined

Line 2 $= \frac{12-(-2)}{6-6}$

$= \frac{14}{0}$

undefined

Parallel

Line 1 passes through (-8, 5) and (-8, -8)
Line 2 passes through (6, 5) and (-2, 5)

Line 1 $= \frac{-8-5}{-8-(-8)}$

$= \frac{-13}{0}$

$=$ undefined

Line 2 $= \frac{5-5}{-2-6}$

$= \frac{0}{-8}$

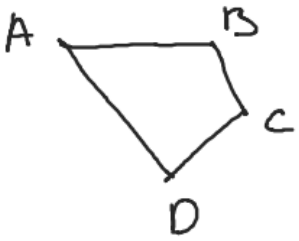
$= 0$

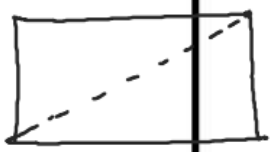
Perpendicular

What you will learn about:
Classifying Quadrilaterals

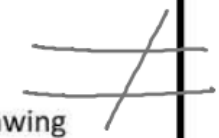
Quadritalterals

4-sides

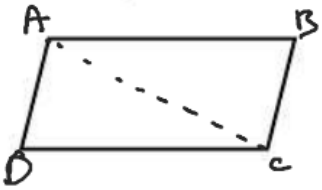




$m\angle A + m\angle B + m\angle C + m\angle D = 360$



Parallelogram

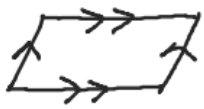


Diagonal → segment that connects non-consecutive Vertices

Properties of a Parallelogram

Drawing

1) Both pairs of opposite sides parallel

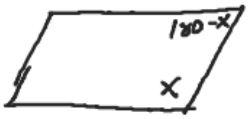


2) Both pairs of opposite Sides congruent

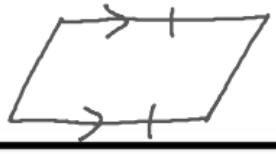
3) Both pairs of opposite Angles congruent

4) Diagonals Bisect eachother

5) Consecutive Angles are Supplementary

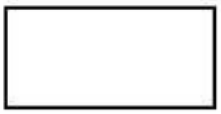


6) One pair of opposite sides BOTH $\cong$ and $\parallel$.



Special Types of Parallelograms

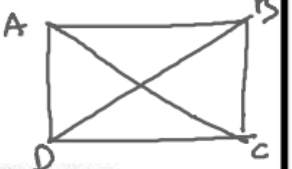
Rectangle



Properties of a Rectangle

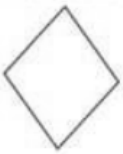
1) Parallelogram
2) All angles are $\cong$
   4 right Angles
3) Diagonals are $\cong$

Drawing



$\overline{AC} \cong \overline{DB}$

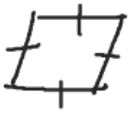
Rhombus



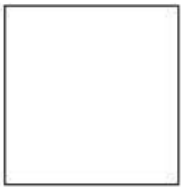
Properties of a Rhombus

1) Parallelogram
2) 4 - congruent sides
3) Diagonals are perpendicular
4) Each Diagonal bisects each pair of opposite Angles

Drawing



Square



Properties of a Square

1) Parallelogram
2) Equilateral (4 $\cong$ sides)
3) Diagonals are perpendicular
4) Equiangular (4 Right angles)
5) Each Diagonal Bisect both pairs of opposite Angles
6) Diagonals are $\cong$

Drawing

$\overline{AC} \cong \overline{BD}$

Coodrinate Proofs	Proving a Quadrilateral is a parallelogram

	How to Prove
1) Both pairs of opposite sides ≅.	Distance Formula
2) Both pairs of opposite sides parallel	Slope
3) One pair of opposite sides BOTH ≅ + Parallel	Distance/slope

Proving a parallelogram is a rectangle

	How to Prove
1) Parallelogram	slope/distance
2) Prove 4 Rt ∠'s Consecutive sides ⊥	Slope
3) Diagonals are ≅	Distance

Proving a parallelogram is a rhombus

	How to Prove
1) Parallelogram	Distance/slope
2) 4 ≅ sides	Distance
3) Diagonals are ⊥	Slope

Proving a parallelogram in a Square

	How to Prove
1) Parallelogram	
2) 4 - right angles	Slope
3) 4 - ≅ sides	distance