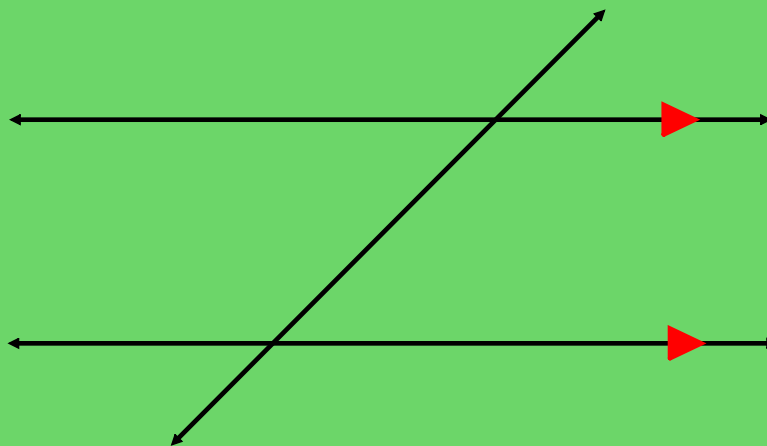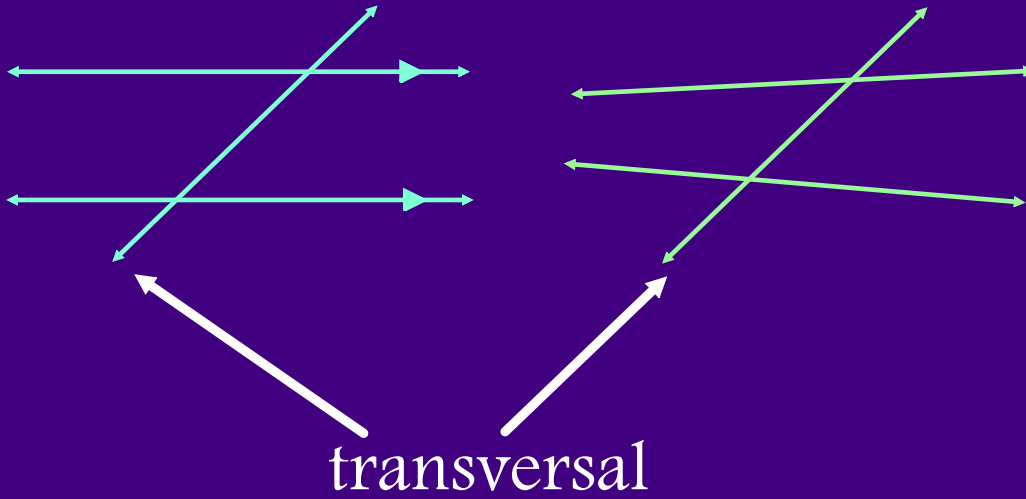# 12.4 PARALLEL LINES

parallel lines - two lines in a plane that never meet

SYMBOL: $\parallel$

The arrows used in diagrams indicate that lines are parallel.
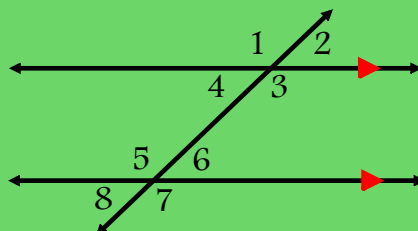
transversal - a line that intersects two or more lines in a plane at different points

transversal

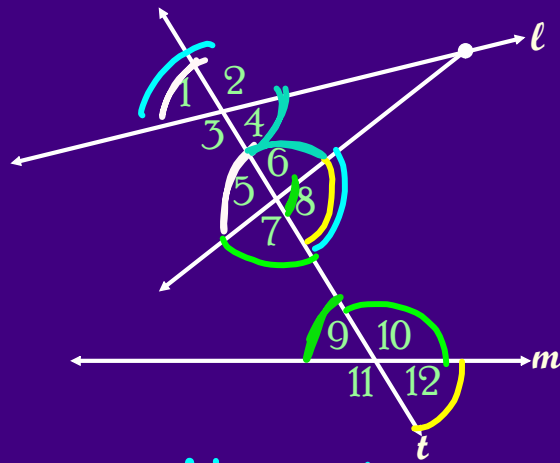SPECIAL ANGLES FORMED BY A TRANSVERSAL AND TWO ___ LINES

EXTERIOR ∠s outside the parallel lines	∠1, ∠2, ∠7, ∠8
INTERIOR ∠s inside parallel lines	∠3, ∠4, ∠5, ∠6
CONSECUTIVE INTERIOR ∠s same side	∠4 ≅ ∠5, ∠3 ≅ ∠6
ALTERNATE INTERIOR ∠s different lines	∠3 ≅ ∠5, ∠4 ≅ ∠6
ALTERNATE EXTERIOR ∠s different lines	∠1 ≅ ∠7, ∠2 ≅ ∠8
CORRESPONDING ∠s match	∠1 ≅ ∠5, ∠2 ≅ ∠6, ∠3 ≅ ∠7, ∠4 ≅ ∠8

EXAMPLE 2
Identify each pair
of angles as one of
the following:
- alternate interior
- alternate exterior
- corresponding
- consecutive interior

A) Angle 1 and Angle 8   *alt. ext.*
B) Angle 7 and Angle 10   *alt. int.*
C) Angle 8 and Angle 12   *corresponding*
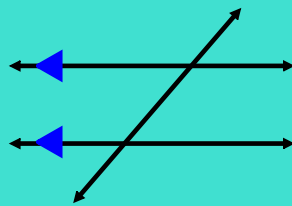D) Angle 1 and Angle 5   *corresponding*
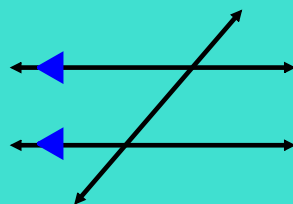E) Angle 4 and Angle 6   *consecutive int.*
F) Angle 8 and Angle 9   *alt. int.*

If two parallel lines are cut by a transversal, then each pair of corresponding angles is congruent.

If two parallel lines are cut by a transversal, then each pair of alternate interior angles is congruent.

If two parallel lines are cut by a transversal, then each pair of consecutive interior angles is supplementary.
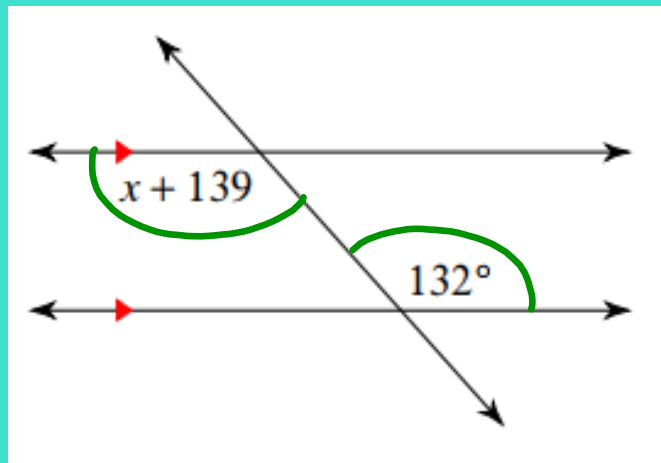
adds to
180°

If two parallel lines are cut by a transversal, then each pair of alternate exterior angles is congruent.

Example 3
Find the value of x.

corresponding

$75 = 11x - 2$
$+2 \qquad\qquad +2$

$\dfrac{77}{11} = \dfrac{11x}{11}$

$\boxed{x = 7}$

75°

$11x - 2$

Example 4
Find the value of x.

$$x + 139 = 132$$
$$-139 \quad -139$$

$$\boxed{x = -7}$$

The diagram shows two parallel lines crossed by a transversal. The upper angle is labeled $x + 139$ and the lower angle is labeled $132°$.

Attachments

12.4 (Part 2) Parallel Lines.notebook