Quadrilaterals

Kite

Kite Properties:

1. Diagonlas ⊥
2. One diagonal is the ⊥ bis. of the other
3. One diagonal bisects a pair of opposite angles
4. One pair of opposite angles ≅

Parallelogram

Parallelogram Properties:

1. Both pairs of opposite sides are ||.
2. Both pairs of opposite sides are ≅.
3. Both pairs of opposite angles are ≅.
4. Diagonals bisect each other.
5. Consecutive angles are supplementary.

Trapezoid

Trapezoid Properties:

1. One pair of || sides (bases)

Iso. Trap.

Isosceles Trapezoid Prop:

1. One pair of || sides (bases)
2. Both pairs of base angles are ≅
3. Diagonals are ≅.

Square

Square Properties:

1. Both pairs of opposite sides are ||.
2. Both pairs of opposite sides are ≅.
3. Both pairs of opposite angles are ≅.
4. Diagonals bisect each other.
5. Consecutive angles are
6. All sides are ≅.
7. Diagonals bisect each other ⊥.
8. Diagonals bisect their angles.
9. All angles are ≅.
10. Diagonals are ≅.
11. All angles are 90°.

Rhombus

Rhombus Properties:

1. Both pairs of opposite sides are ||.
2. Both pairs of opposite sides are ≅.
3. Both pairs of opposite angles are ≅.
4. Diagonals bisect each other
5. Consecutive angles are supplementary.
6. All sides are ≅.
7. Diagonals bisect each other ⊥.
8. Diagonals bisect their angles.

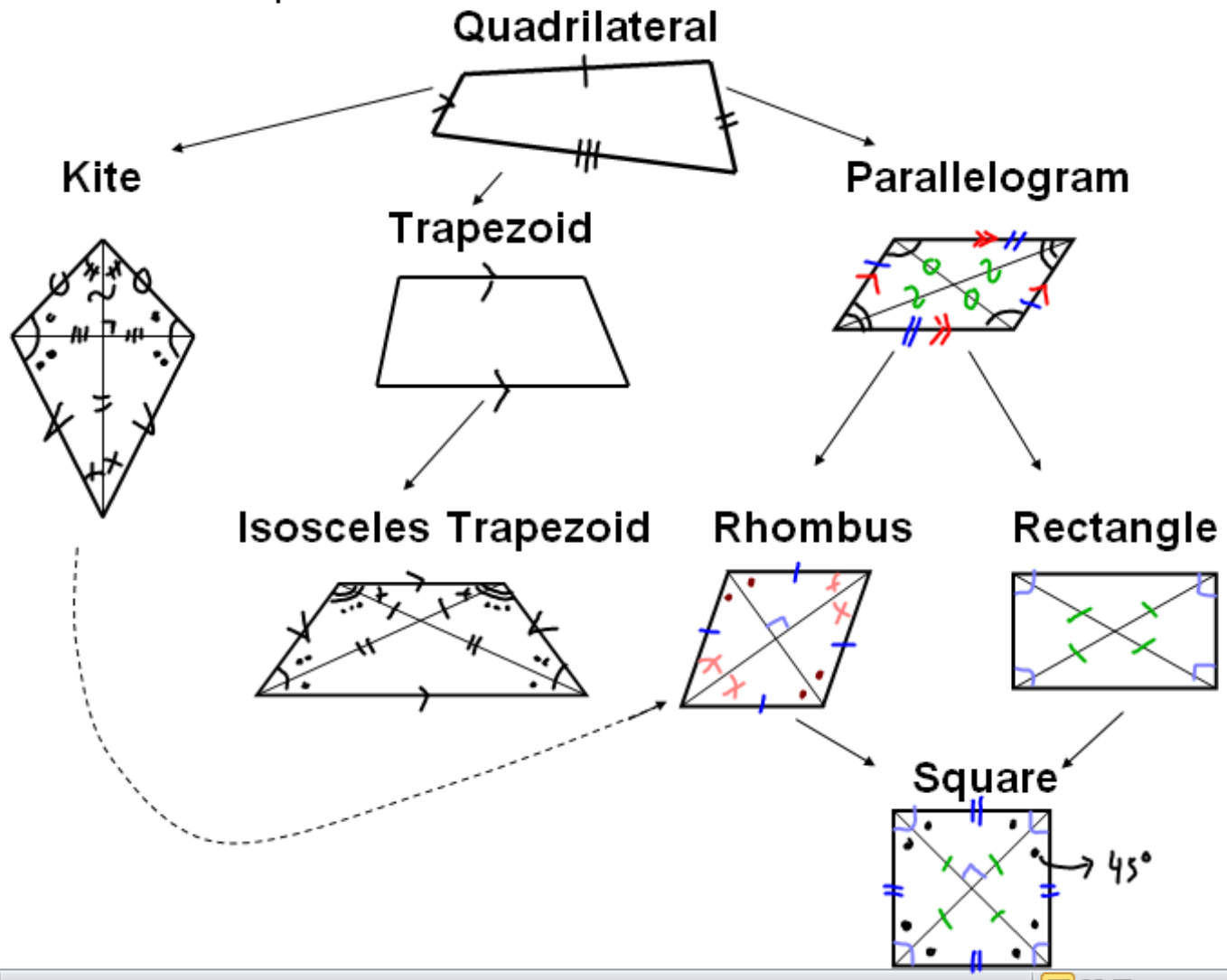
Rectangle

Rectangle Properties:

1. Both pairs of opposite sides are ||.
2. Both pairs of opposite sides are ≅.
3. Both pairs of opposite angles are ≅.
4. Diagonals bisect each other.
5. Consecutive angles are
6. All angles are ≅.
7. Diagonals are ≅.
8. All angles are 90°.

Use this page to make tick marks based on the properties.

QUADRILATERAL FAMILY TREE



5.5. Honors Geometry **DATE:** 12/11

Algebra Practice with Quadrilateral Properties

1) A pair of consecutive angles of a parallelogram has measures in the ratio of 3:6. Find the measure of the larger angle.

Since consecutive ∠s are supp. in a ||-gram,

$3x + 6x = 180$

$9x = 180$

$x = 20$

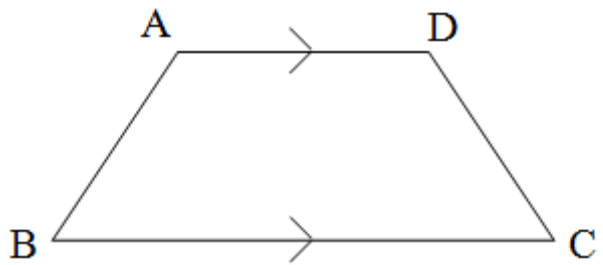
Larger ∠ $= 6x = 6(20) = 120$ ✓

2) Given: Isosceles Trapezoid $ABCD$

$m\angle A = 3x + 15$

$m\angle B = 2x - 10$

Find: $m\angle D$ _____

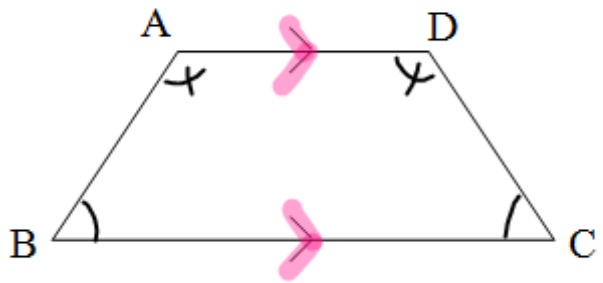


2) Given: Isosceles Trapezoid $ABCD$

$m\angle A = 3x + 15$

$m\angle B = 2x - 10$

Find: $m\angle D$ 120°



Base $\angle$s $\cong$

$\overline{AD} \parallel \overline{BC} \Rightarrow$ SSI $\angle$s supp.

$\therefore \angle A + \angle B = 180$

$3x + 15 + 2x - 10 = 180$

$5x + 5 = 180$

$-5 \quad -5$

$\frac{5x}{5} = \frac{175}{5}$

$x = 35$

Since $\angle A \cong \angle D = 3x + 15$

$= 3(35) + 15$

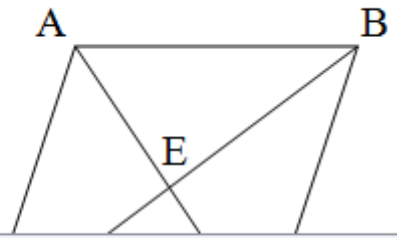
$= 120$

$\therefore \angle D = 120°$

3) Given: Rhombus $ABCD$

$m\angle DAB = 120$

$DB = 10\sqrt{3}$



3) Given: Rhombus $ABCD$

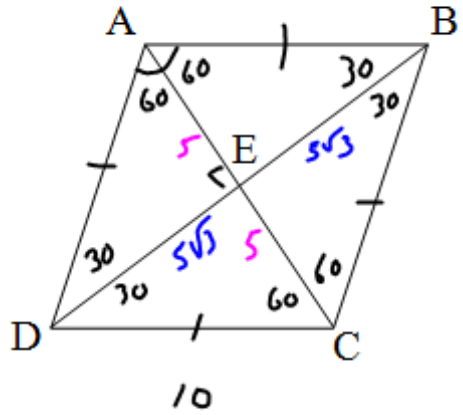
$m\angle DAB = 120$

$DB = 10\sqrt{3}$

$AC = 10$

Find: Perimeter of $ABCD$ 40 units

Measure of all other angles.



$\angle DCB = 120°$

$\angle ABC = 60°$

$\angle ADC = 60°$

$a^2 + b^2 = c^2$

$5^2 + (5\sqrt{3})^2 = c^2$

$25 + 75 = c^2$

$\sqrt{100} = \sqrt{c^2}$

$10 = c$

$P = 4(10) = 40$

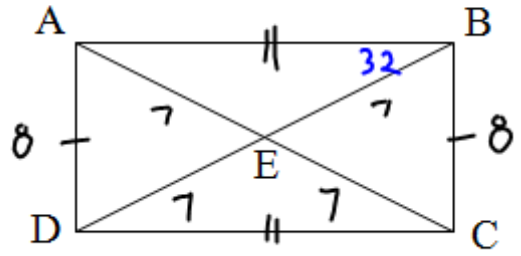
See me if you need help here...

4) Given: Rectangle $ABCD$

$AD = 12$

$AE = 7$

$m\angle ABD = 32$



Find: $m\angle DBC$ 58 BC 8

$m\angle BDC$ 32 BD 7+7=14

Since $\angle ABC = 90$, $90 - 32 = 58^\circ = \angle DBC$

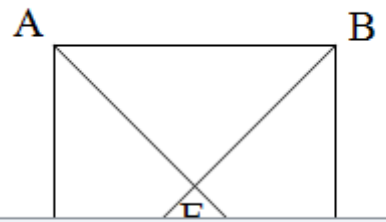
Since $\overline{AB} \parallel \overline{DC}$ (gets from ||-gram), $\angle ABD \cong \angle BDC$ A.I.∠s ≅

$\therefore \angle BDC = 32$

5) Given: Square $ABCD$

$BC = 8$

$AE = 4\sqrt{2}$



Find: $m\angle BEC$ BD

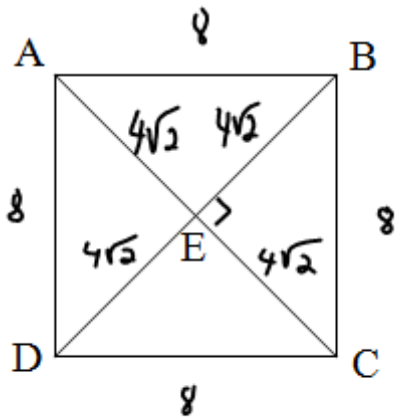
5) Given: Square $ABCD$

$BC = 8$

$AE = 4\sqrt{2}$

Find: $m\angle BEC$ $90°$ BD $8\sqrt{2}$

$m\angle EAD$ $45°$ AB 8

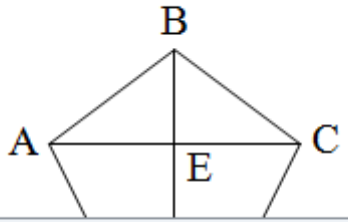


$BD = 4\sqrt{2} + 4\sqrt{2} = 8\sqrt{2}$

6) Given: Kite $ABCD$

$\overline{BA} \perp \overline{AD}$

$m\angle BEC = 5x - 10$



6) Given: Kite $ABCD$ $\angle BCD = 90°$

$\overline{BA} \perp \overline{AD} \Rightarrow \angle BAC = 90°$

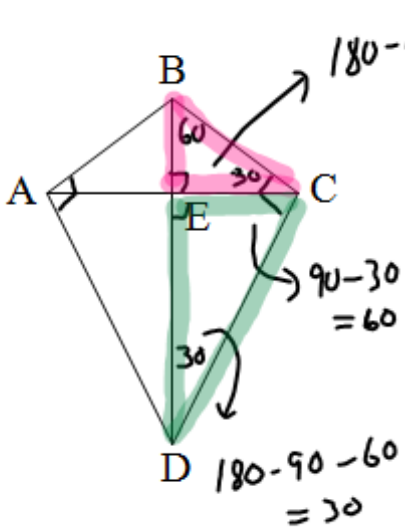
$m\angle BEC = 5x - 10$

$m\angle ABC = 6x$

Find: $m\angle EBC$ 60°

$m\angle EDC$ 30°

$m\angle BCD$ 90°



Since diag. ⊥,

$5x - 10 = 90$

$+10 \quad +10$

$5x = 100$

$\frac{5x}{5} = \frac{100}{5}$

$x = 20$

$\angle ABC = 6x = 120$

$\therefore \angle EBC \cong \angle EBA = 60$

120/2