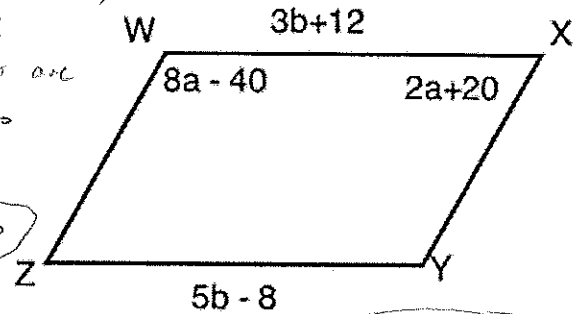


Consider parallelogram WXYZ.

#1 MATH FACTS

- opposite angles are \cong , so $\angle Z \cong \angle X$
- Consecutive angles are supplementary, so $\angle W + \angle X = 180^\circ$



1. Find the measure of $\angle Z$

60°

$$8a - 40 + 2a + 20 = 180^\circ$$

$$10a - 20 = 180^\circ$$

$$10a = 200 \Rightarrow a = 20$$

2. Find the length of \overline{ZY}

#2 MATH FACT

opposite sides \cong

$$3b + 12 = 5b - 8$$

$$b = 10$$

WARNING: $8a - 40 \neq 2a + 20$

plug into $\angle X$: $2(20) + 20 = 60^\circ$

$$5(10) - 8 = 42$$

$\angle X = \angle Z$, so $\angle Z = 60^\circ$

Consider parallelogram ABCD with diagonals intersecting at E.

3. If $AC = 12x - 6$, and $AE = 2x + 9$, find the length of EC.

#3 MATH FACT

Diagonals bisect each other

WARNING: $2x + 9 \neq 12x - 6$

$$12x - 6 = (2x + 9) \cdot 2$$

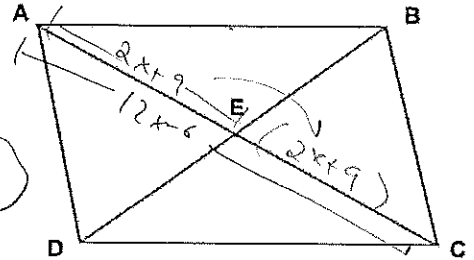
$$12x - 6 = 4x + 18$$

$$8x = 24$$

$$x = 3$$

plug into $AE = 2(3) + 9 \rightarrow 15$

$AE = EC$, so $EC = 15$



Consider rectangle ABCD.

4. If $AR = 4x - 2$ and $BR = x + 7$, find the length of AC.

#4 MATH FACT

Rectangles' diagonals are \cong

20

$$4x - 2 = x + 7$$

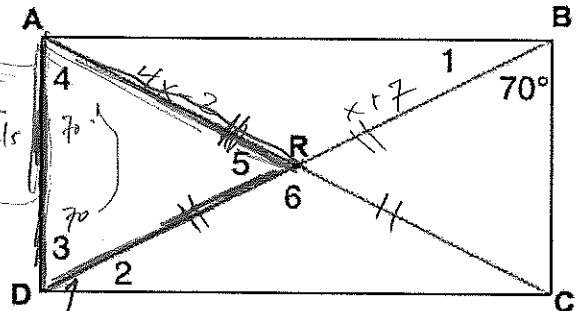
$$3x = 9$$

$$x = 3$$

plug into AR: $4(3) - 2 = 10$

$AR = RC$, so $RC = 10$

so $AC = 20$



Isosceles Δ

5. Find the angle measures:

$$\angle 1 = 20^\circ \quad \angle 2 = 20^\circ \quad \angle 3 = 70^\circ$$

$$\angle 4 = 70^\circ \quad \angle 5 = 40^\circ$$

Isosceles Δ sum is 180°

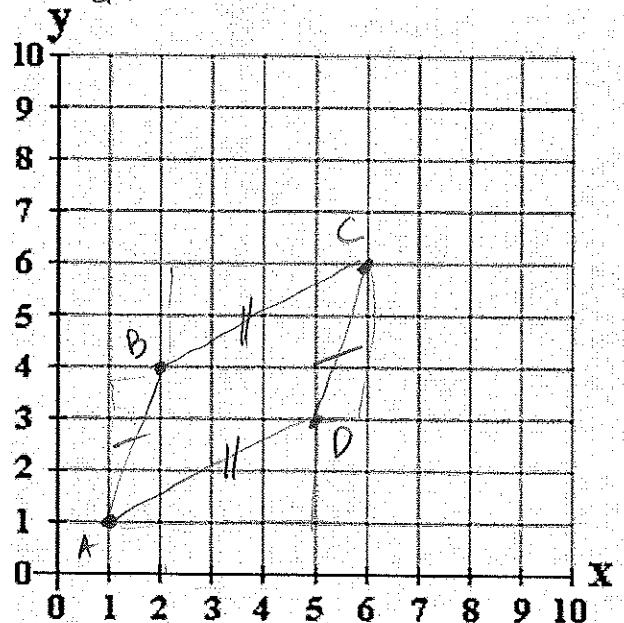
6. What is the most specific name for the quadrilateral formed by the points A(1,1), B(2,4), C(6,6), and D(5,3)?

Parallelogram

Square? no (dun)

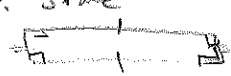
Rectangle? No (dun)

Rhombus? Sides aren't \cong , so no



7. True or false (if false, write or show an explanation): All rectangles are squares.

Squares have 4 ≅ sides and 4 right angles. Some rectangles don't have all 4 sides ≅, like this:



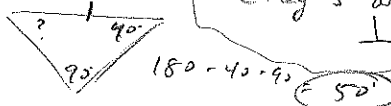
Consider rhombus DCBA with diagonals intersecting at E.

8. Find the angle measures

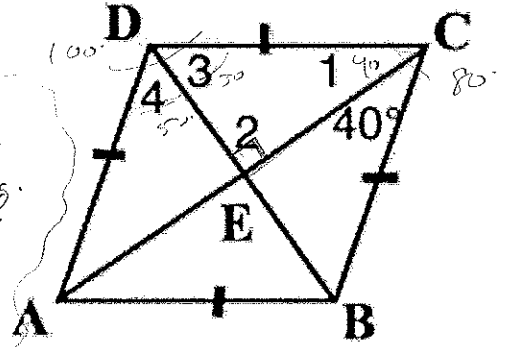
$\angle 1 = 40^\circ$ $\angle 2 = 90^\circ$ $\angle 3 = 50^\circ$

$\angle 4 = 50^\circ$ $\angle ABC = 100^\circ$

Opp. Angles



#8 Math Facts
 • Rhombus diag. bisect angles
 • Rhombus diag's are ⊥



CO-C10b

9. Consider the triangle with coordinates A(-1, -2), B(3, 7), and C(4, 4). Find the coordinates of the centroid of ΔABC (not shown)

(2, 3)

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right) \rightarrow \left(\frac{-1 + 3 + 4}{3}, \frac{-2 + 7 + 4}{3} \right) = \left(\frac{6}{3}, \frac{9}{3} \right) = (2, 3)$$

10. D, E, and F are midpoints. Find the perimeter of ΔABC.

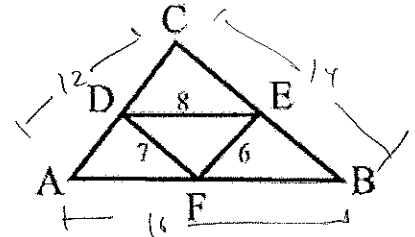
42

#10 math fact
 midsegments are half the length of the third side

Sum of sides

$12 + 14 + 16$

= 42



CO-C10a

11. The vertex angle of an isosceles triangle measures 20°. Find the measure of each base angle.

80

#11 math fact
 2 Base angles of isos. Δ are ≅

$180 - 20 = 160^\circ$ left over

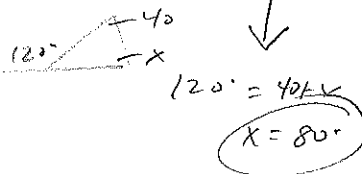
$\frac{160^\circ}{2} = 80^\circ$



12. The exterior angle of a triangle measures 120° and one of the remote interior angles measures 40°. Find the measure of the other remote interior angle.

80

#12 MATH FACT: Exterior Angle Theorem



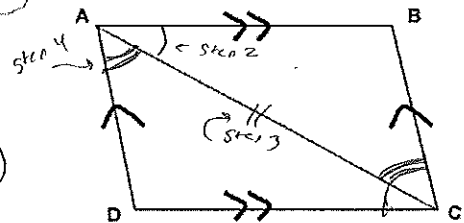
$120^\circ = 40^\circ + x$
 $x = 80^\circ$

SRT-B5b: Complete the proof.

Given: $\overline{AB} \parallel \overline{CD}$

Prove: $\angle D \cong \angle B$

Statements	Reasons
1. $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle BAC \cong \angle DCA$	2. Alt. Int. Angles
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive Property
4. $\angle DAC \cong \angle BCA$	4. Alternate Int. Angles
5. $\triangle ACD \cong \triangle CAB$	5. ASA
6. $\angle D \cong \angle B$	6. CPCTC



See "Triangle Congruence proofs Made Easy" for help.

Possible reasons: (may be used more than once)

- Vertical angles Congruent Definition of bisect CPCTC Reflexive Property
- HL SAS SSS ASA AAS SSA AAA
- Alternate Interior Angles
- (got left off)