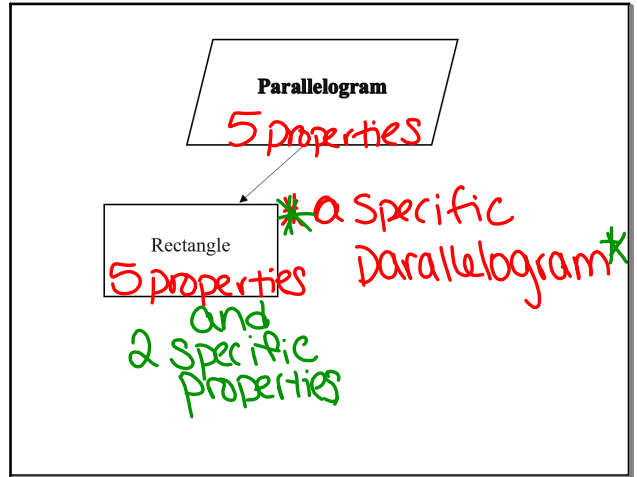


Handwritten math problems and solutions for rectangles:

- Problem 1: $5x + 4y = 102$, $2x + 10 + 3x = 180$. Solution: $x = 10, y = 13$.
- Problem 2: $4x - 20 = 9x - 50$, $20 = 5x - 50$, $30 = 5x$, $6 = x$. Solution: $x = 6$.
- Problem 3: $10x = 100$, $x = 10$. Solution: $x = 10$.
- Problem 4: $9x - 7 = 85$, $9x = 90$, $x = 10$. Solution: $x = 10$.
- Problem 5: $5x - 9 = 3x + 11$, $2x - 9 = 11$, $2x = 20$, $x = 10$. Solution: $x = 10$.
- Problem 6: $5x + 11 = 41$, $5x = 30$, $x = 6$. Solution: $x = 6$.

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Properties of a Rectangle:

- 1) ALL of the properties of a parallelogram
 - Opposite sides are **parallel** and **congruent**
 - Opposite angles are \cong
 - Consecutive angles are supplementary
 - Diagonals bisect each other

Handwritten notes:

- "next to each other" with an arrow pointing to consecutive angles.
- "cross and cut in half" with an arrow pointing to diagonals bisecting each other.
- "add to 180" with an arrow pointing to opposite angles.

Equations for opposite angles:

$$\begin{aligned} \angle A + \angle C &= 180 \\ \angle B + \angle D &= 180 \\ \angle C + \angle D &= 180 \\ \angle A + \angle B &= 180 \end{aligned}$$

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2) All angles are right angles 90°

Diagram of a rectangle with vertices A, B, C, and D. Right angle symbols are shown at each corner. Handwritten text says "ALL one = 1".

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3) Diagonals are congruent

Diagram of a rectangle with vertices A, B, C, and D. Diagonals AC and BD are drawn and labeled with "12". Below the diagram, it says $AD \cong CB$.

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Examples:

1) In rectangle ABCD, diagonal $AC = 4x + 6$ and diagonal $BD = 5x - 2$. Solve for x .

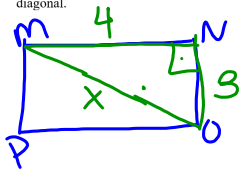

Diagram of a rectangle with vertices A, B, C, and D. Diagonal AC is labeled $4x + 6$ and diagonal BD is labeled $5x - 2$.

Handwritten solution:

$$\begin{aligned} 4x + 6 &= 5x - 2 \\ -4x & \quad -4x \\ \hline 6 &= x - 2 \\ +2 & \quad +2 \\ \hline 8 &= x \end{aligned}$$

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2) In rectangle MNOP diagonal MO is drawn. If $MN = 4$ and $NO = 3$, find the length of the diagonal.

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

$$3^2 + 4^2 = x^2$$

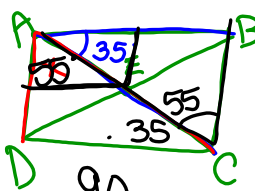
$$9 + 16 = x^2$$

$$\sqrt{25} = \sqrt{x^2}$$

$$5 = x$$

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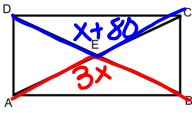
3) In rectangle ABCD, the diagonals intersect at E. $m\angle CAB = 35$, find the measures of $\angle CAD$ and $\angle ACB$.



$$\begin{array}{r} 90 \\ - 35 \\ \hline 55 \end{array}$$

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4) In the diagram below, $m\angle AEB = 3x$ and $m\angle DEC = x + 80$. Solve for x.



$$3x = x + 80$$

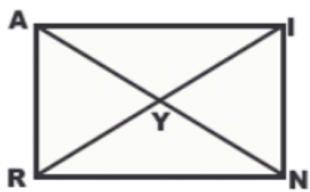
$$\begin{array}{r} 3x = x + 80 \\ -x \quad -x \\ \hline 2x = 80 \\ \frac{2x}{2} = \frac{80}{2} \end{array} \quad x = 40$$

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5) In rectangle ABCD, diagonal $AC = 3x + 15$ and diagonal $BD = 4x - 5$. Find the length of AC.

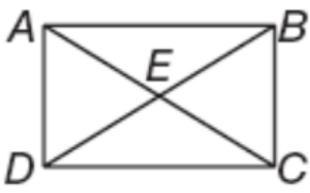
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6) In rectangle RAIN, $YR = 3x$ and $NY = 18$. Solve for x.



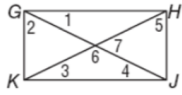
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7) If $m\angle DAC = 2x + 4$ and $m\angle BAC = 3x + 1$, find $m\angle BAC$.



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8) In the rectangle below, $m\angle 1 = 37$. Find the measure of $\angle 2$ and $\angle 4$.



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