

Quadrilaterals: Rectangles

Notes and Assignment

Properties of the Sides:

- Both pairs of opposite sides parallel
 - $\overline{FH} \parallel \overline{EI}$ and $\overline{FE} \parallel \overline{HI}$
- Both pairs of opposite sides congruent
 - $\overline{FH} \cong \overline{EI}$ and $\overline{FE} \cong \overline{HI}$

Diagonals create congruent right triangles.

Properties of Rectangles

1-9, ABCD is a rectangle, find each angle if $m\angle 1 = 36^\circ$

- $m\angle 3 = 18^\circ$
- $m\angle 4 = 72^\circ$
- $m\angle 6 = 72^\circ$
- $m\angle 7 = 36^\circ$
- $m\angle 9 = 72^\circ$
- $m\angle 10 = 18^\circ$

CD is a rectangle, with diagonals

B

$$\begin{aligned} 2x + 6 &= 36 \\ 2x &= 30 \\ x &= 15 \end{aligned}$$
$$\begin{aligned} 2y - 6 &= 12 \\ 2y &= 18 \\ y &= 9 \end{aligned}$$

Secondary
Math Shop

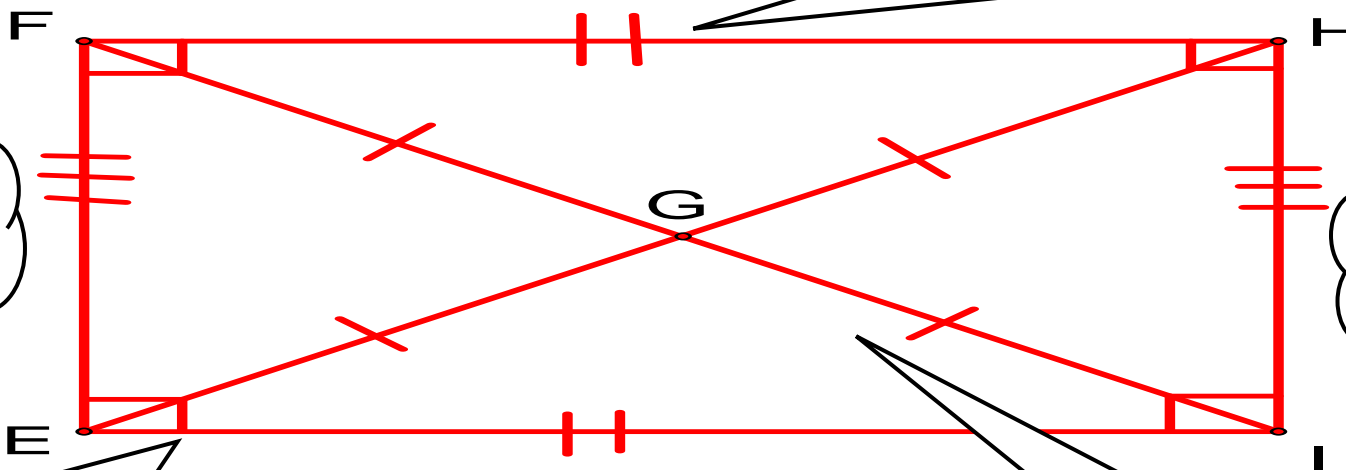
Properties of Rectangles --- Notes

A rectangle is defined as a parallelogram with four right angles

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Interior angle sum of 360 degrees.



Diagonals create congruent right triangles.

Properties of the Angles:

- Both pairs of opposite angles congruent
 - $\angle F \cong \angle I$ and $\angle E \cong \angle H$
- Consecutive angles are supplementary
 - $\angle E + \angle I = 180$, $\angle I + \angle H = 180$,
 - $\angle H + \angle F = 180$, $\angle F + \angle E = 180$
- Four right angles
 - $m\angle E = m\angle I = m\angle H = m\angle F = 90$

Bisected diagonals create isosceles triangles.

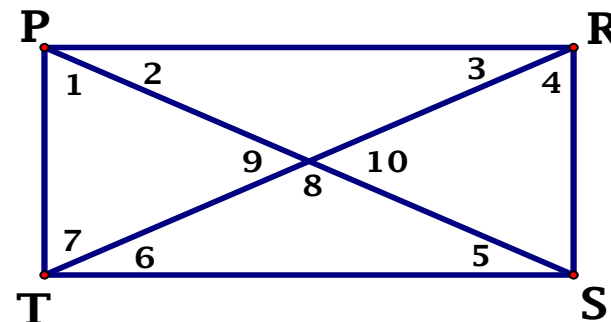
Properties of the Diagonals:

- Diagonals bisect each other
 - $\overline{FG} \cong \overline{GI}$ and $\overline{EG} \cong \overline{GH}$
- Diagonals are congruent
 - $\overline{FI} \cong \overline{EH}$

Examples

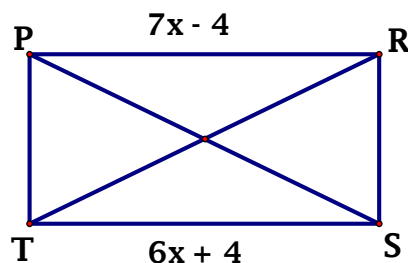
Examples 1 - 9, PRST is a rectangle, find each angle if $m\angle 1 = 50^\circ$

- | | | |
|---|--|---|
| 1. $m\angle 2 = $ 40° | 2. $m\angle 3 = $ 40° | 3. $m\angle 4 = $ 50° |
| 4. $m\angle 5 = $ 40° | 5. $m\angle 6 = $ 40° | 6. $m\angle 7 = $ 50° |
| 7. $m\angle 8 = $ 100° | 8. $m\angle 9 = $ 80° | 9. $m\angle 10 = $ 80° |



Examples 10 - 13, PRST is a rectangle, find the value of each variable.

10.



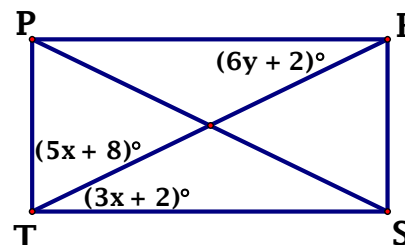
Opposite sides congruent

$$7x - 4 = 6x + 4$$

$$x - 4 = 4$$

$$x = 8$$

11.



Four Right Angles

$$5x + 8 + 3x + 2 = 90$$

$$8x + 10 = 90$$

$$8x = 80; x = 10$$

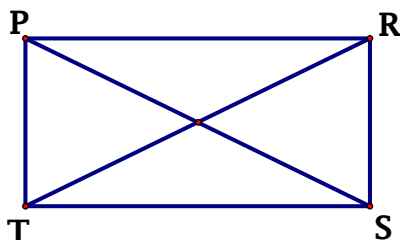
Alternate Interior Angles \cong

$$6y + 2 = 3(10) + 2$$

$$6y + 2 = 32$$

$$6y = 30; y = 5$$

12. $PS = 6x + 3$, $RT = 7x - 2$



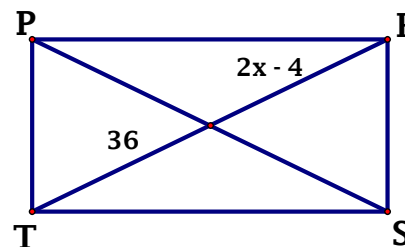
Diagonals congruent

$$7x - 2 = 6x + 3$$

$$x - 2 = 3$$

$$x = 5$$

13.



Diagonals bisect e. o.

$$2x - 4 = 36$$

$$2x = 40$$

$$x = 20$$

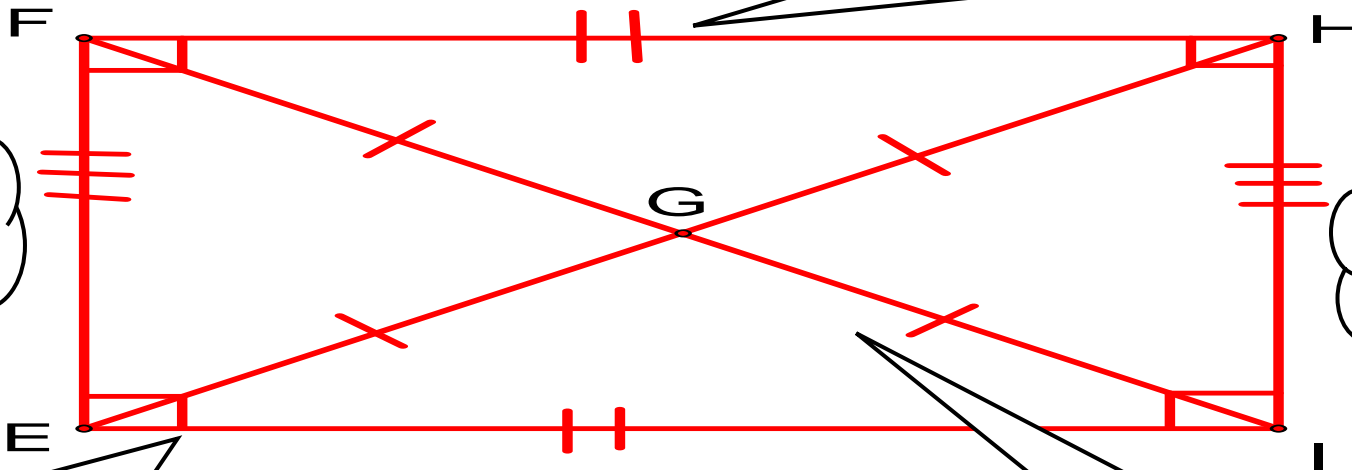
Properties of Rectangles --- Notes

A rectangle is defined
as a parallelogram
with _____

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Interior
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Properties of the Diagonals:

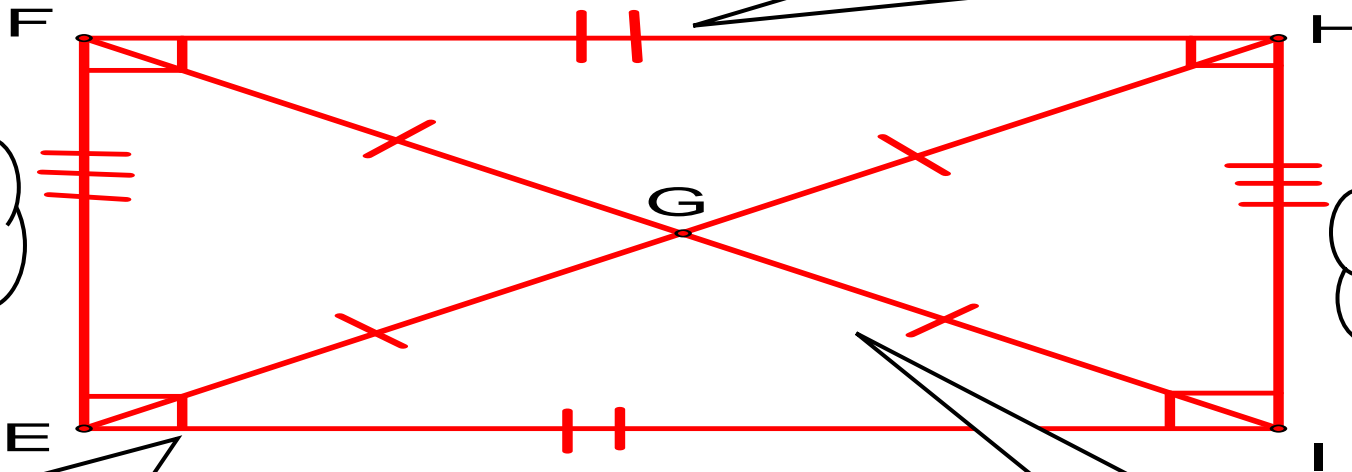
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- Both pairs of opposite sides congruent
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Properties of the Angles:

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- Consecutive angles are supplementary
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- Four right angles
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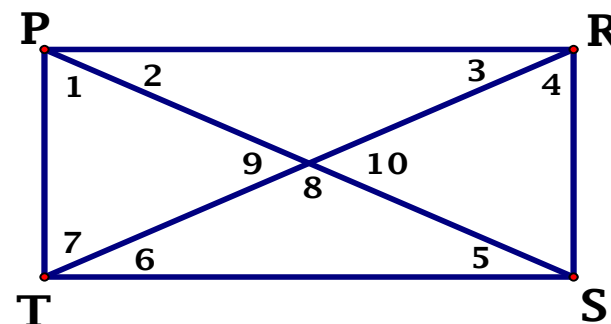
Properties of the Diagonals:

- Diagonals bisect each other
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- Diagonals are congruent
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Examples

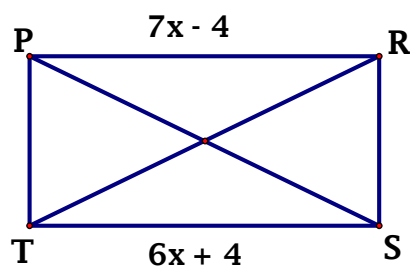
Examples 1 - 9, PRST is a rectangle, find each angle if $m\angle 1 = 50^\circ$

1. $m\angle 2 =$ _____
2. $m\angle 3 =$ _____
3. $m\angle 4 =$ _____
4. $m\angle 5 =$ _____
5. $m\angle 6 =$ _____
6. $m\angle 7 =$ _____
7. $m\angle 8 =$ _____
8. $m\angle 9 =$ _____
9. $m\angle 10 =$ _____

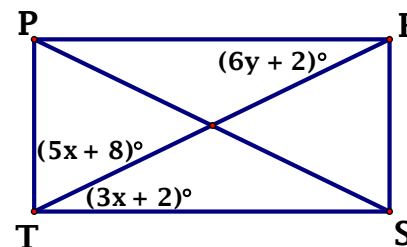


Examples 10 - 13, PRST is a rectangle, find the value of each variable.

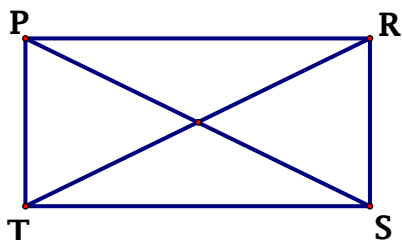
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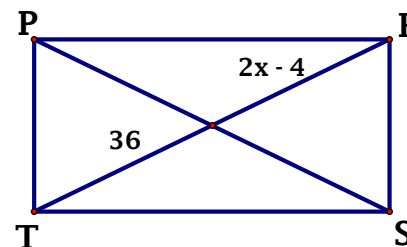
11.



12. $PS = 6x + 3$, $RT = 7x - 2$



13.



Name: _____ ANSWER KEY _____ Hour: _____ Date: _____

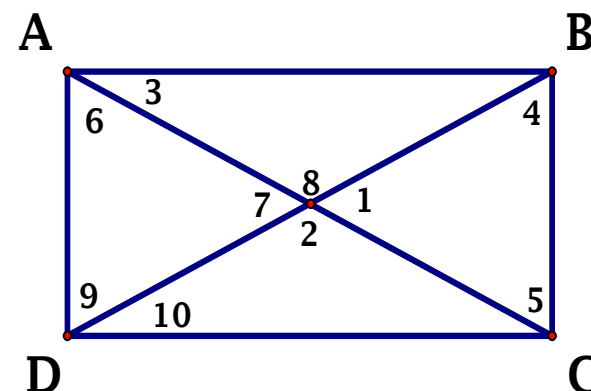
Properties of Rectangles --- Assignment

Questions 1 - 9, ABCD is a rectangle, find each angle if $m\angle 1 = 36^\circ$

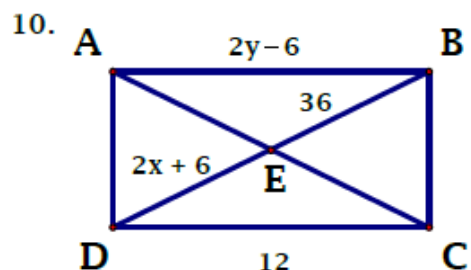
1. $m\angle 2 = 144^\circ$ 2. $m\angle 3 = 18^\circ$ 3. $m\angle 4 = 72^\circ$

4. $m\angle 5 = 72^\circ$ 5. $m\angle 6 = 72^\circ$ 6. $m\angle 7 = 36^\circ$

7. $m\angle 8 = 144^\circ$ 8. $m\angle 9 = 72^\circ$ 9. $m\angle 10 = 18^\circ$

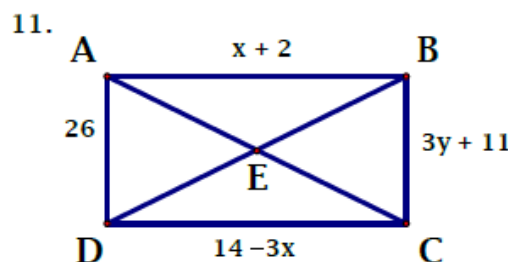


Questions 10 - 13, ABCD is a rectangle, with diagonals that intersect at E. Find the value of each variable.



$$\begin{aligned} 2x + 6 &= 36 \\ 2x &= 30 \\ x &= 15 \end{aligned}$$

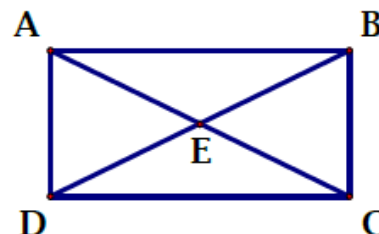
$$\begin{aligned} 2y - 6 &= 12 \\ 2y &= 18 \\ y &= 9 \end{aligned}$$



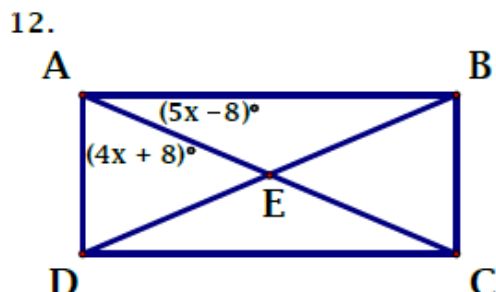
$$\begin{aligned} x + 2 &= 14 - 3x \\ 4x + 2 &= 14 \\ 4x &= 12 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 3y + 11 &= 26 \\ 3y &= 15 \\ y &= 5 \end{aligned}$$

13. $AC = x + 7$, $DB = 6x - 8$



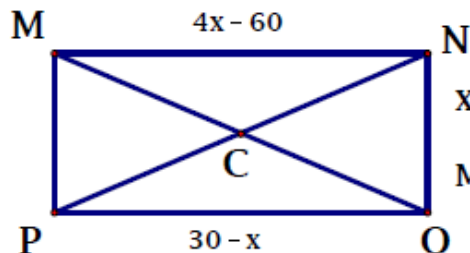
$$\begin{aligned} x + 7 &= 6x - 8 \\ 7 &= 5x - 8 \\ 15 &= 5x \\ 3 &= x \end{aligned}$$



$$\begin{aligned} 5x - 8 + 4x + 8 &= 90 \\ 9x &= 90 \\ x &= 10 \end{aligned}$$

Questions 14 - 19, MNOP is a rectangle, with diagonals that intersect at C. Find the value of each variable or the missing part.

14.

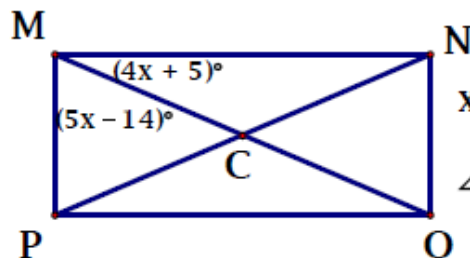


$$x = 15$$

$$MN = 15$$

$$\begin{aligned} 4x - 60 &= 30 - x \\ 5x - 60 &= 30 \\ 5x &= 90 ; x = 15 \\ MN &= 4(15) - 60 = 15 \end{aligned}$$

16.

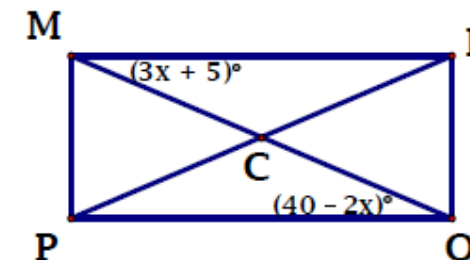


$$x = 11$$

$$\angle CMP = 41$$

$$\begin{aligned} 5x - 14 + 4x + 5 &= 90 \\ 9x - 9 &= 90 \\ 9x &= 99 ; x = 11 \\ \angle CMP &= 5(11) - 14 = 41 \end{aligned}$$

18.

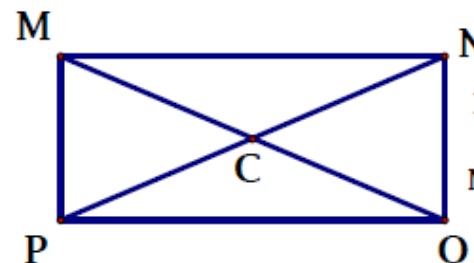


$$x = 7$$

$$\angle MOP = 26$$

$$\begin{aligned} 3x + 5 &= 40 - 2x \\ 5x + 5 &= 40 \\ 5x &= 35 ; x = 7 \\ \angle MOP &= 40 - 2(7) = 26 \end{aligned}$$

15. $MO = 4x - 60$, $MC = x + 5$

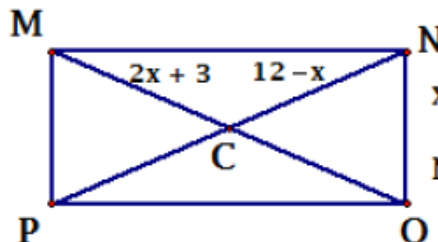


$$x = 35$$

$$MO = 80$$

$$\begin{aligned} 2(x + 5) &= 4x - 60 \\ 2x + 10 &= 4x - 60 \\ 10 &= 2x - 60 \\ 70 &= 2x ; x = 35 \\ MO &= 4(35) - 60 = 80 \end{aligned}$$

17.

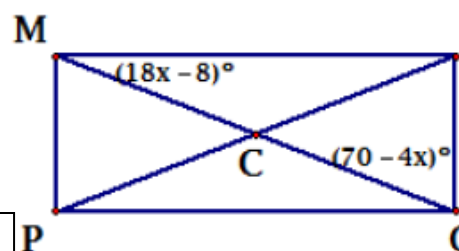


$$x = 3$$

$$NP = 18$$

$$\begin{aligned} 2x + 3 &= 12 - x \\ 3x + 3 &= 12 \\ 3x &= 9 ; x = 3 \\ NP &= 2(12 - 3) = 18 \end{aligned}$$

19.



$$x = 2$$

$$\angle OMN = 28$$

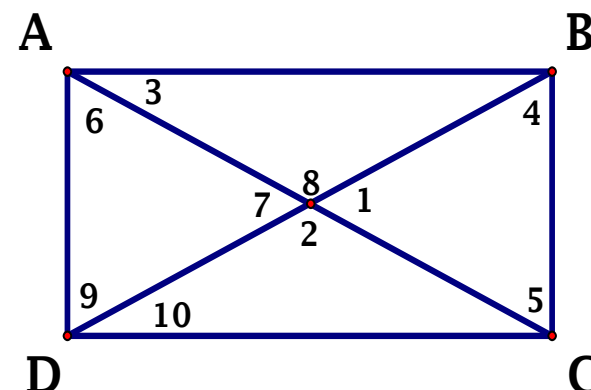
$$\begin{aligned} 18x - 8 + 70 - 4x &= 90 \\ 14x + 62 &= 90 \\ 14x &= 28 ; x = 2 \\ \angle OMN &= 18(2) - 8 = 28 \end{aligned}$$

Name: _____ Hour: _____ Date: _____

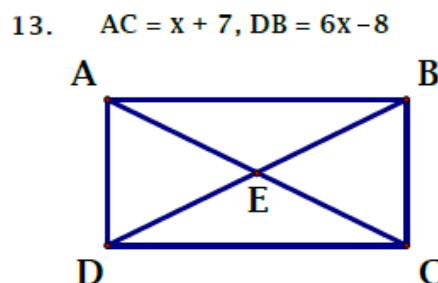
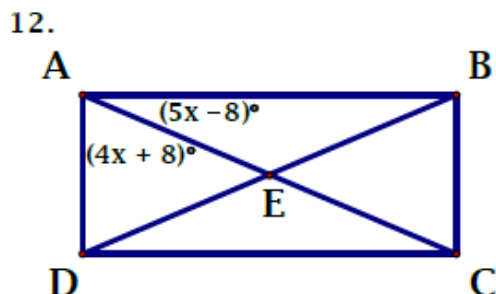
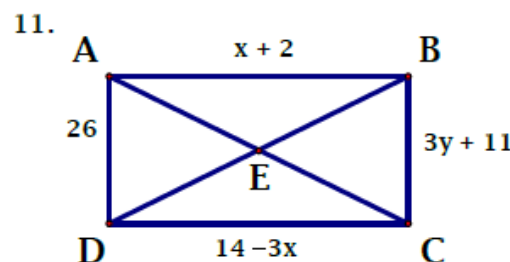
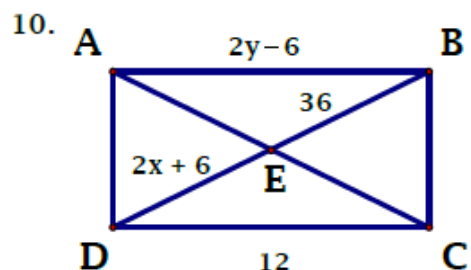
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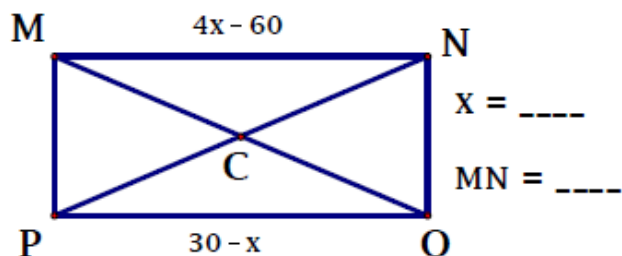


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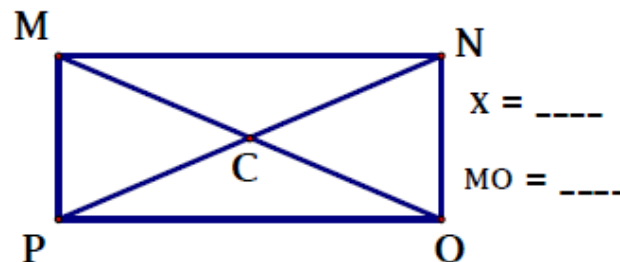


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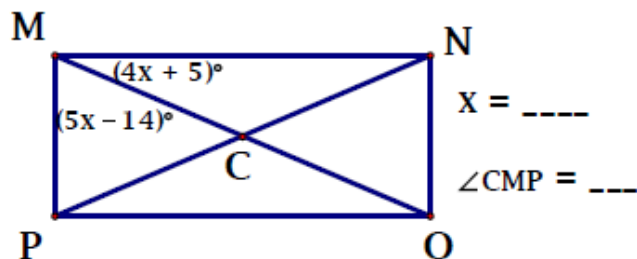
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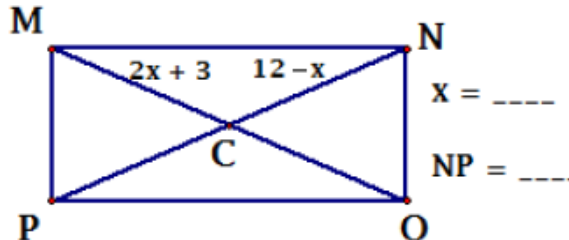
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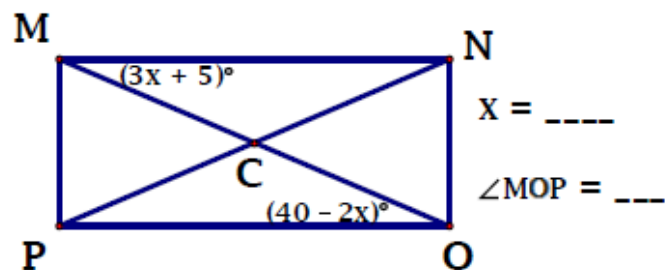
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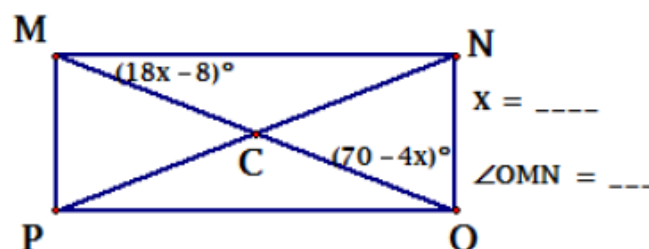
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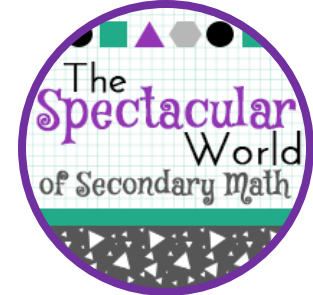
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