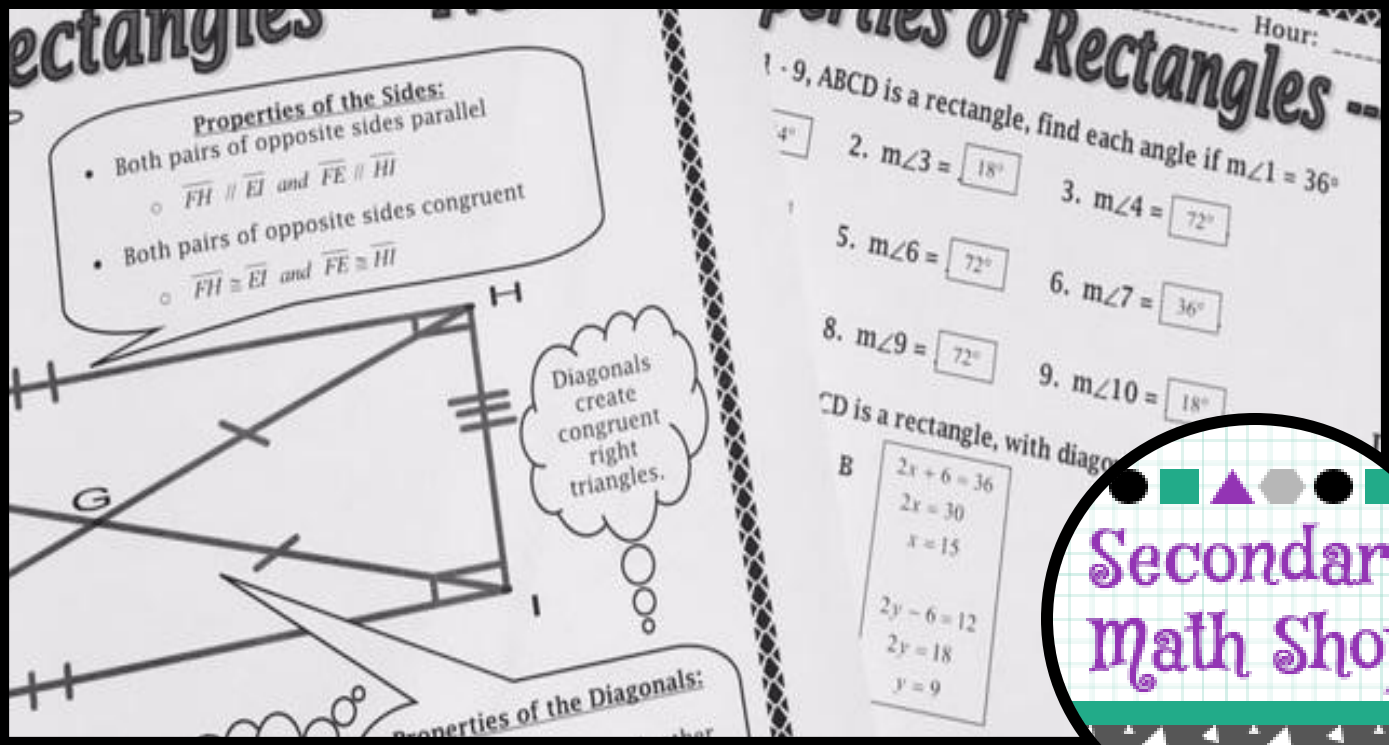
Quadrilaterals: Rectangles

Notes and Assignment



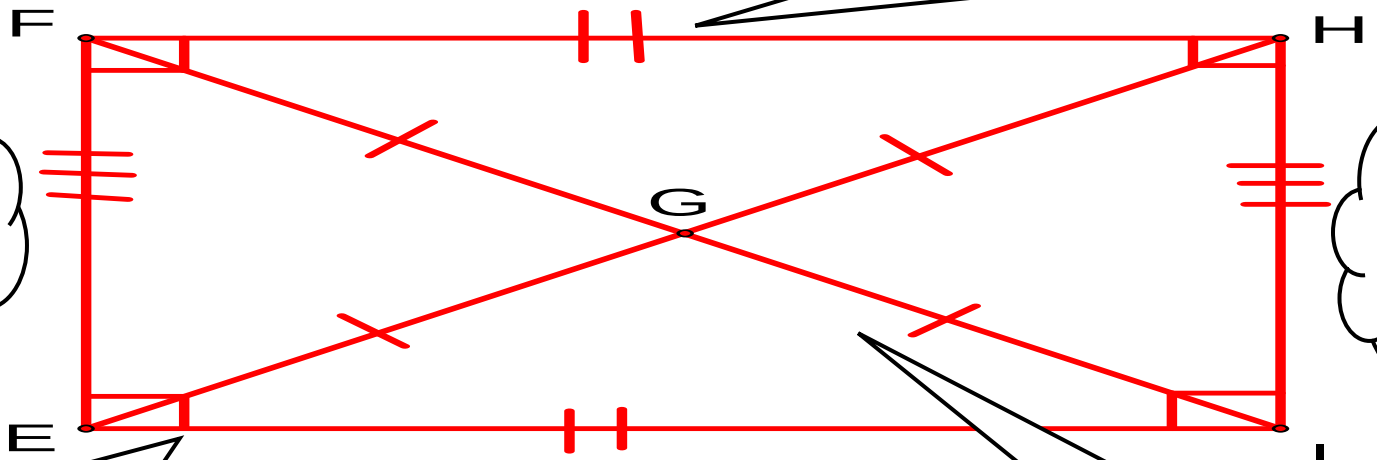
Secondary Math Shop

Properties of Rectangles --- Notes

A rectangle is defined as a parallelogram with four right angles

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* $\overline{FE} \cong \overline{HI}$



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
  - $m\angle E = m\angle I = m\angle H = m\angle F = 90$

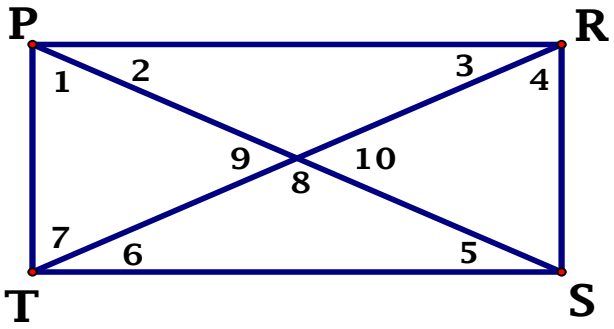
Bisected diagonals create isosceles triangles.

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

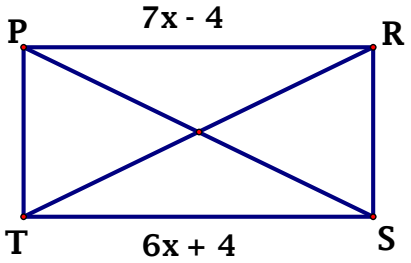
Examples 1 - 9, PRST is a rectangle, find each angle if m∠1 = 50°



1. m∠2 = 40°
2. m∠3 = 40°
3. m∠4 = 50°
4. m∠5 = 40°
5. m∠6 = 40°
6. m∠7 = 50°
7. m∠8 = 100°
8. m∠9 = 80°
9. m∠10 = 80°

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

10.



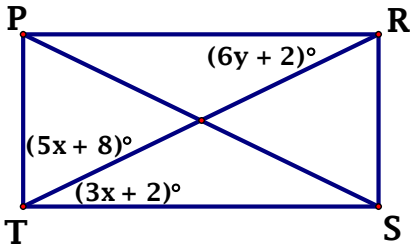
Opposite sides congruent

$7x - 4 = 6x + 4$

$x - 4 = 4$

$x = 8$

11.



Four Right Angles

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

$8x + 10 = 90$

$8x = 80;\ x = 10$

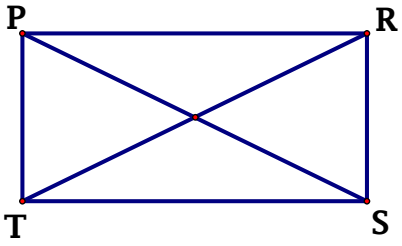
Alternate Interior Angles ≅

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

$6y + 2 = 32$

$6y = 30;\ y = 5$

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



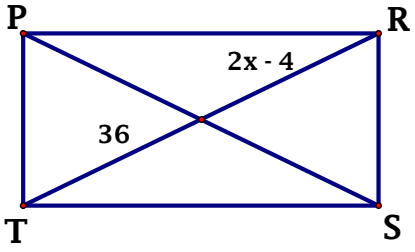
Diangonals congruent

$7x - 2 = 6x + 3$

$x - 2 = 3$

$x = 5$

13.



Diangonals 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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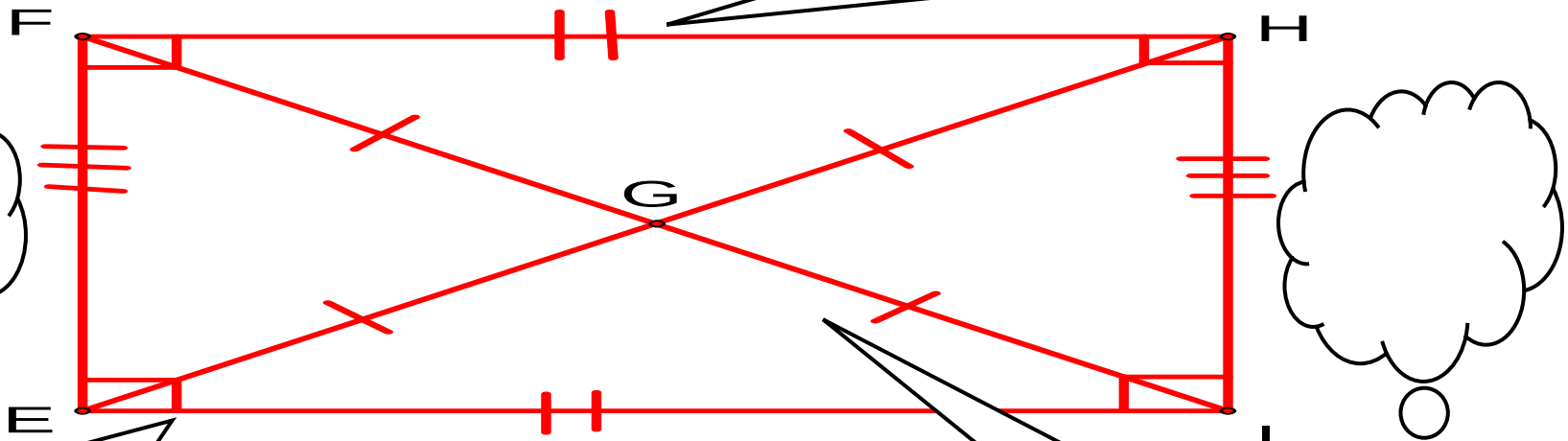

Interior angle sum of 360 degrees.

Properties of the Angles:

- Both pairs of opposite angles congruent
  - $\angle F \cong \angle I$ *and* $\angle E \cong \angle H$
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- Four right angles
  -

Properties of the Diagonals:

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

Properties of Rectangles --- Notes

A rectangle is defined as a parallelogram with _____

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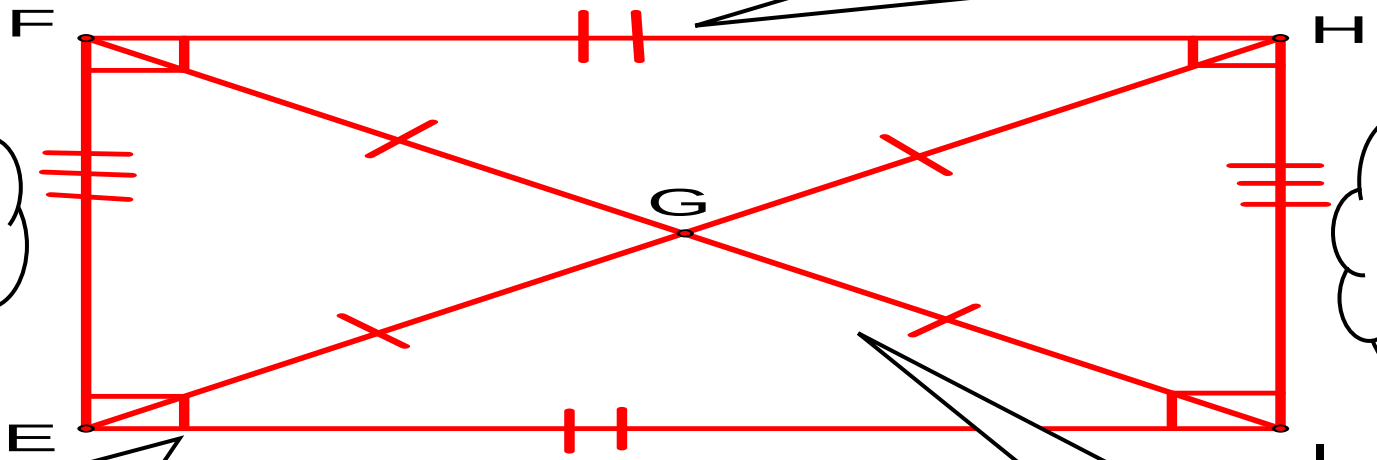
- Both pairs of opposite sides parallel
  -
- Both pairs of opposite sides congruent
  -



Properties of the Angles:

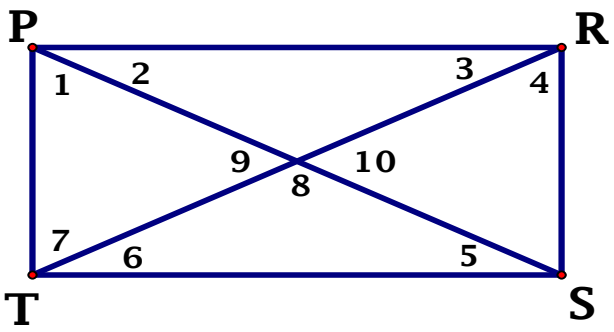
- Both pairs of opposite angles congruent
  -
- Consecutive angles are supplementary
  -
- Four right angles
  -

Properties of the Diagonals:

- Diagonals bisect each other
  -
- Diagonals are congruent
  -

Examples

Examples 1 - 9, PRST is a rectangle, find each angle if m∠1 = 50°



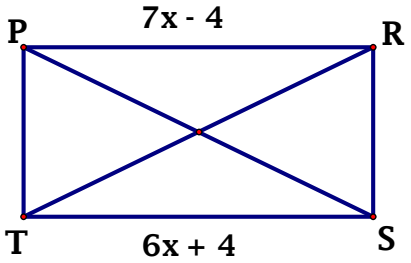
1. m∠2 = _____ 2. m∠3 = _____ 3. m∠4 = _____

4. m∠5 = _____ 5. m∠6 = _____ 6. m∠7 = _____

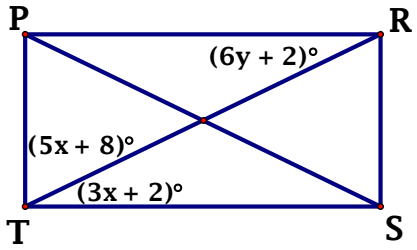
7. m∠8 = _____ 8. m∠9 = _____ 9. m∠10 = _____

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

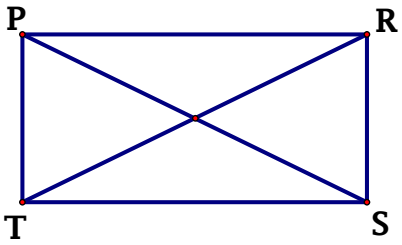
10.



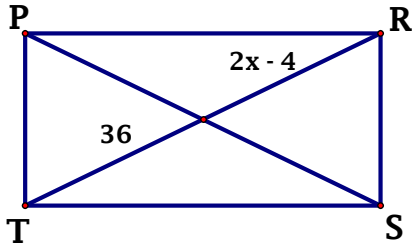
11.



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



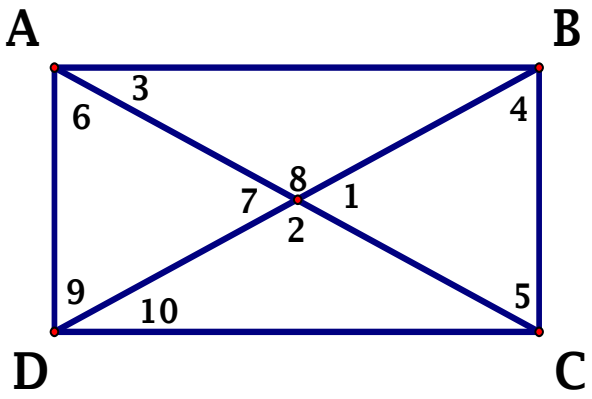
13.



Name: _____ANSWER KEY_____ Hour: _____ Date: _____

Properties of Rectangles --- Assignment

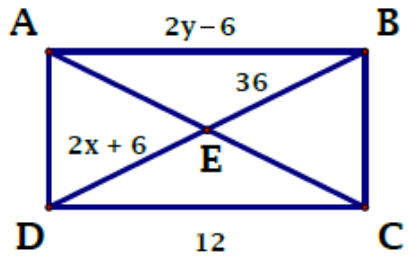
Questions 1 - 9, ABCD is a rectangle, find each angle if m∠1 = 36°



1. m∠2 = 144°
2. m∠3 = 18°
3. m∠4 = 72°
4. m∠5 = 72°
5. m∠6 = 72°
6. m∠7 = 36°
7. m∠8 = 144°
8. m∠9 = 72°
9. m∠10 = 18°

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

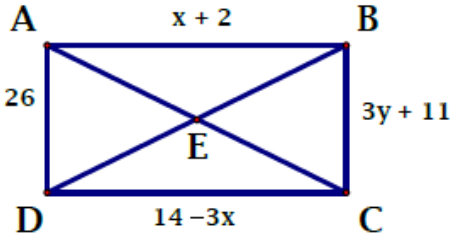
10.



$2x + 6 = 36$
$2x = 30$
$x = 15$

$2y - 6 = 12$
$2y = 18$
$y = 9$

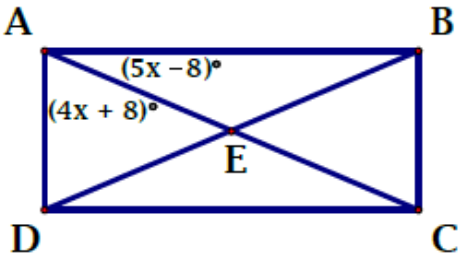
11.



$x + 2 = 14 - 3x$
$4x + 2 = 14$
$4x = 12$
$x = 3$

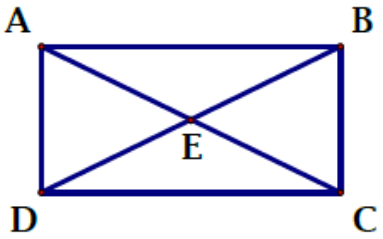
$3y + 11 = 26$
$3y = 15$
$y = 5$

12.



$5x - 8 + 4x + 8 = 90$
$9x = 90$
$x = 10$

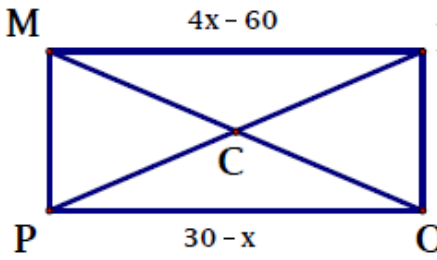
13. AC = x + 7, DB = 6x −8



$x + 7 = 6x - 8$
$7 = 5x - 8$
$15 = 5x$
$3 = x$

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

14.

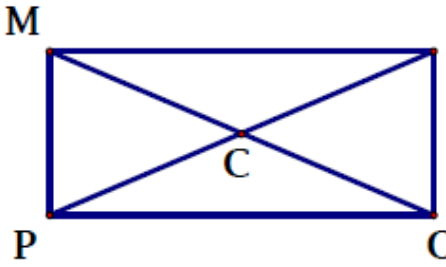


X = 15

MN = 15

$4x - 60 = 30 - x$
$5x - 60 = 30$
$5x = 90\ ;\ x = 15$
$MN = 4(15) - 60 = 15$

15. MO = 4x – 60, MC = x + 5

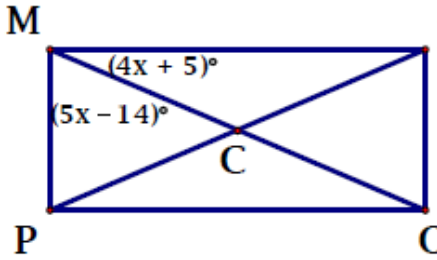


X = 35

MO = 80

$2\ (x + 5) = 4x - 60$
$2x + 10 = 4x - 60$
$10 = 2x - 60$
$70 = 2x\ ;\ x = 35$
$MO = 4(35) - 60 = 80$

16.

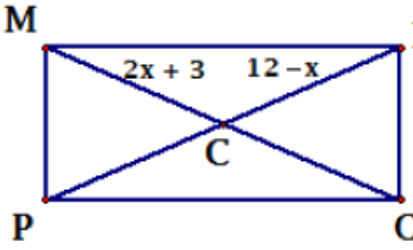


X = 11

∠CMP = 41

$5x - 14 + 4x + 5 = 90$
$9x - 9 = 90$
$9x = 99\ ;\ x = 11$
$\angle CMP = 5(11) - 14 = 41$

17.

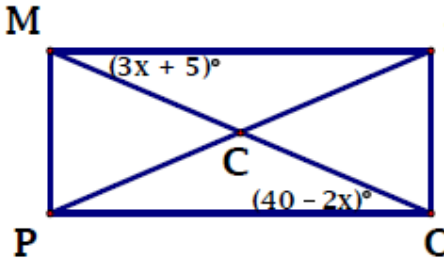


X = 3

NP = 18

$2x + 3 = 12 - x$
$3x + 3 = 12$
$3x = 9\ ;\ x = 3$
$NP = 2\ (12 - 3) = 18$

18.

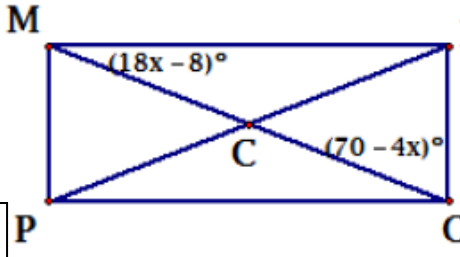


X = 7

∠MOP = 26

$3x + 5 = 40 - 2x$
$5x + 5 = 40$
$5x = 35\ ;\ x = 7$
$\angle MOP = 40 - 2(7) = 26$

19.



X = 2

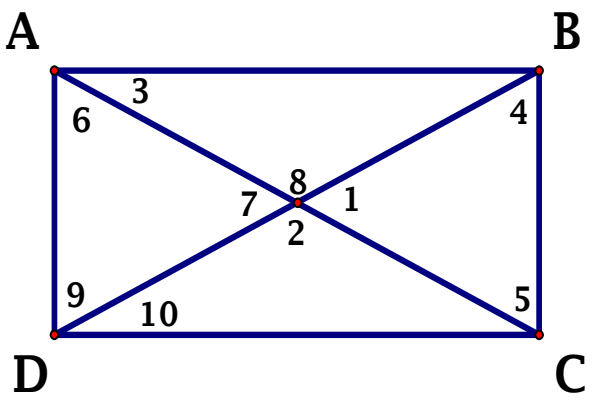
∠OMN = 28

$18x - 8 + 70 - 4x = 90$
$14x + 62 = 90$
$14x = 28\ ;\ x = 2$
$\angle OMN = 18(2) - 8 = 28$

Name: _____ Hour: _____ Date: _____

Properties of Rectangles --- Assignment

Questions 1 - 9, ABCD is a rectangle, find each angle if m∠1 = 36°



1. m∠2 = _____ 2. m∠3 = _____ 3. m∠4 = _____

4. m∠5 = _____ 5. m∠6 = _____ 6. m∠7 = _____

7. m∠8 = _____ 8. m∠9 = _____ 9. m∠10 = _____

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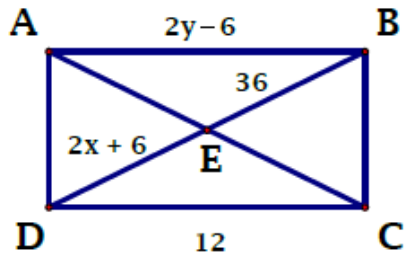

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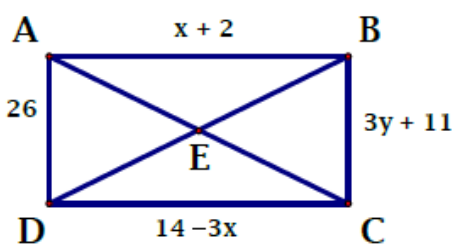

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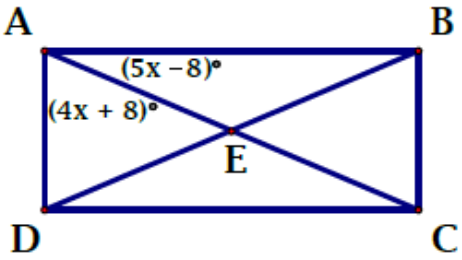
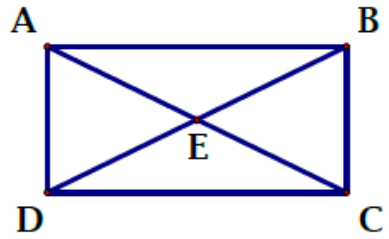


13. AC = x + 7, DB = 6x − 8



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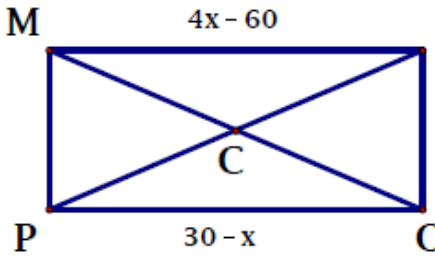
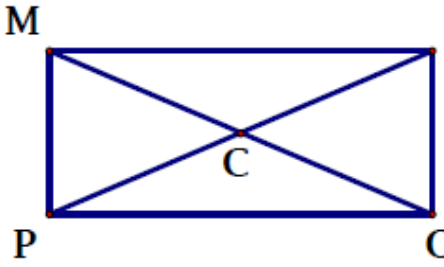


X = ____

MN = ____

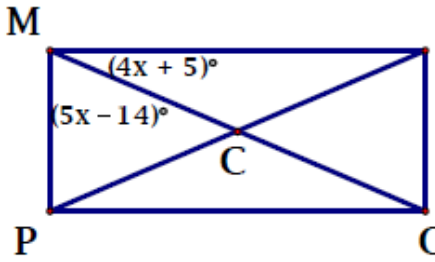
15. MO = 4x – 60, MC = x + 5



X = ____

MO = ____

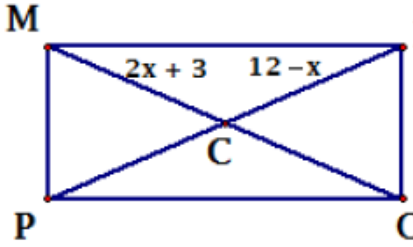
16.



X = ____

∠CMP = ___

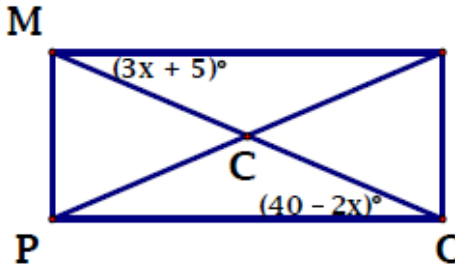
17.



X = ____

NP = ____

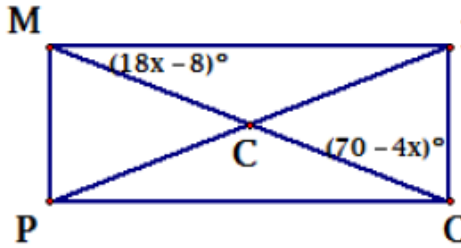
18.



X = ____

∠MOP = ___

19.



X = ____

∠OMN = ___

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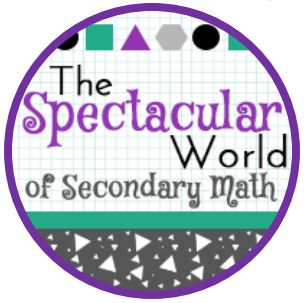

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