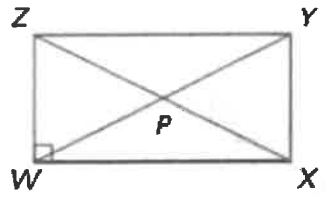
Activity 15 Extra Practice (rectangles, rhombuses, and squares)

Name: KEY Date: _____

Quadrilateral *WXYZ* is a rectangle.



1) If $ZP = 4x - 9$ and $PY = 2x + 5$, find ZX.

$ZP = PY$

$4x - 9 = 2x + 5$

$2x = 14$

$x = 7$

$ZX = 2(ZP)$

$ZX = 2(4(7) - 9)$

$\boxed{ZX = 38}$

2) If $m\angle ZYW = 2x - 7$ and $m\angle WYX = 2x + 5$, find $m\angle ZYW$.

$m\angle ZYW + m\angle WYX = 90°$

$2x - 7 + 2x + 5 = 90$

$4x - 2 = 90$

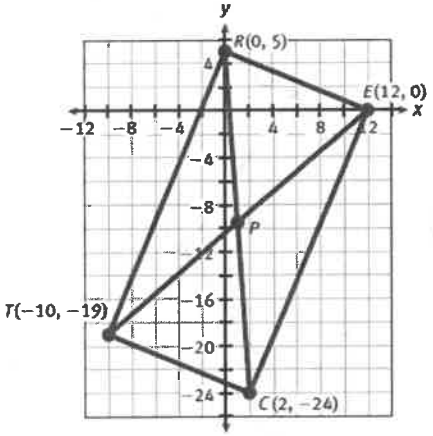
$4x = 92$

$x = 23$

$\boxed{m\angle ZYW = 39°}$

$m\angle ZYW = 2(23) - 7$

The figure *RECT* is a rectangle.



3) What are the coordinates of *P*?

$P = \left(\frac{0+2}{2}, \frac{5+(-24)}{2}\right)$

$\boxed{P = \left(1, -\frac{19}{2}\right)}$

4) What is *TE*? How does that compare to *RC*?

$TE = \sqrt{(12-(-10))^2 + (0-(-19))^2}$

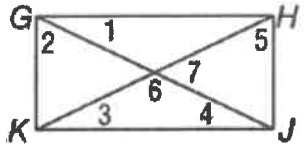
$TE = \sqrt{22^2 + 19^2} = \sqrt{845} = 13\sqrt{5}$

$RC = \sqrt{(2-0)^2 + (-24-5)^2}$

$RC = \sqrt{2^2 + (-29)^2} = \sqrt{845} = 13\sqrt{5}$

$\boxed{\overline{TE} \cong \overline{RC}}$

Quadrilateral *GHJK* is a rectangle. Find each measure if $m\angle 1 = 43°$.



5) $m\angle 2$ 47° $(90° - m\angle 1)$

6) $m\angle 3$ 43° $(\angle 1 \cong \angle 3)$

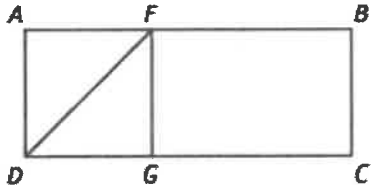
7) $m\angle 4$ 43° $(\angle 1 \cong \angle 3 \cong \angle 4)$

8) $m\angle 5$ 47° $(\angle 2 \cong \angle 5)$

9) $m\angle 6$ 94° $(m\angle 6 + m\angle 3 + m\angle 4 = 180°)$

10) $m\angle 7$ 86° $(m\angle 6 + m\angle 7 = 180°)$

11) In the diagram, *ABCD* is a rectangle. $\overline{DF}$ bisects $\angle ADC$ and $\overline{FG} \parallel \overline{AD}$. Complete this proof that *AFGD* is a square.



It is given that $\overline{DF}$ bisects a right angle, so $m\angle ADF =$ 45°. We know that $\angle A$ is a right angle because *ABCD* is a rectangle, so ΔAFD is a right triangle. In a right triangle, the acute angles are complementary, so $m\angle AFD = 45°$. That means ΔAFD is an isosceles triangle, and $AF = AD$. We know that *AFGD* is a parallelogram because $\overline{AF} \parallel \overline{DG}$ (opposite sides of a rectangle are parallel) and $\overline{AD} \parallel \overline{FG}$ (Given). We have shown that *AFGD* is a parallelogram with a right angle and two consecutive congruent sides, so AFGD is a square

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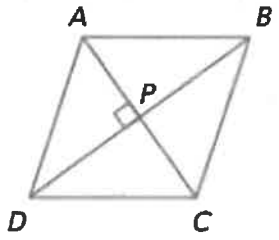
12) One student proved that quadrilateral *UTAH* is a rectangle. Another student proved that *UTAH* is a rhombus. What else can you prove about *UTAH*? *Explain*.

UTAH is a rectangle, so it has all right angles. Also, UTAH is a rhombus, so it has four congruent sides. Therefore, UTAH is a square by the definition of a square.

Quadrilateral *ABCD* is a rhombus. Find each value or measure.



13) If $m\angle BCD = 114°$, find $m\angle BAC$.

$m\angle BAC = 57°$

14) If $AP = 3x - 1$ and $PC = x + 9$, find AC.

$AP = PC$

$3x - 1 = x + 9$

$2x = 10$

$x = 5$

$AC = AP + PC$

$AC = 3(5) - 1 + (5) + 9$

$AC = 28$

15) if $m\angle ABC = 2x - 7$ and $m\angle BCD = 2x + 3$, find $m\angle DAB$.

$m\angle ABC + m\angle BCD = 180$

$2x - 7 + 2x + 3 = 180$

$4x - 4 = 180$

$4x = 184$

$x = 46$

$m\angle DAB = m\angle BCD$

$m\angle DAB = 95°$

16) if $m\angle BPC = 5x - 15$, find x.

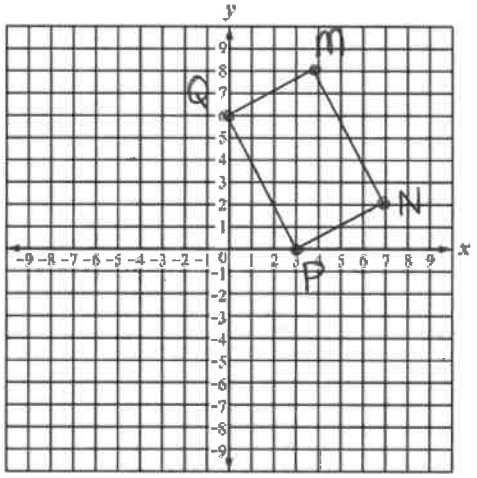
$m\angle BPC = 90°$

$5x - 15 = 90$

$5x = 105$

$x = 21$

17) The vertices of quadrilateral *MNPQ* are $M(4,8)$, $N(7,2)$, $P(3,0)$, and $Q(0,6)$. Show that *MNPQ* is a rectangle.



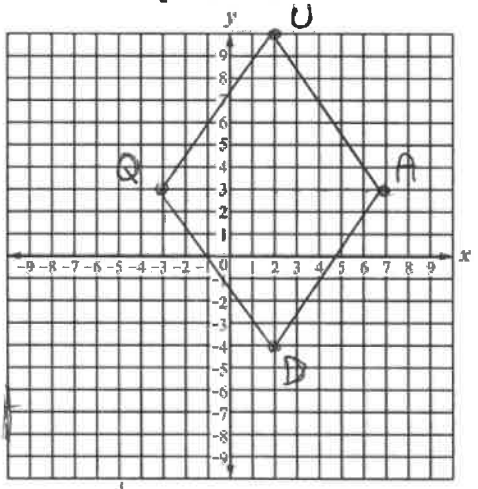
consecutive sides are perpendicular

slope of $\overline{QM}$ and $\overline{PN}$ is $\frac{1}{2}$

slope of $\overline{QP}$ and $\overline{MN}$ is -2

$\therefore m\angle M = m\angle N = m\angle P = m\angle Q = 90°$

18) The vertices of a quadrilateral are $Q(-3,3)$, $U(2,10)$, $A(7,3)$, and $D(2,-4)$. Show that *QUAD* is a rhombus.



opposite sides are parallel

slope of $\overline{QU}$ and $\overline{DA}$ $= \frac{7}{5}$

slope of $\overline{QD}$ and $\overline{UA}$ $= -\frac{7}{5}$

the figure is equilateral:

$QU = UA = AD = DQ = \sqrt{73}$