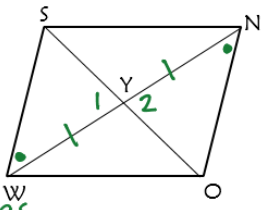
6.4 Special Properties Homework

Part 1: Parallelograms

3) Write a two-column proof.

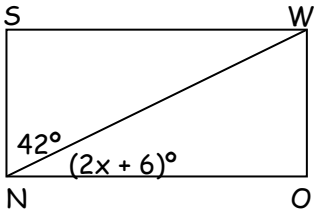
Given: Y is the midpoint of $\overline{WN}$
$\angle SWY \cong \angle ONY$
Prove: SNOW is a ▱



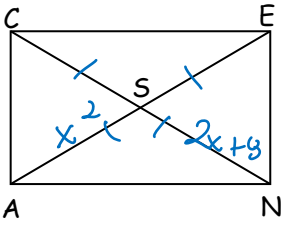
S	R
① Y is midpt of $\overline{WN}$	① Given
② $\overline{WY} \cong \overline{YN}$	② If midpt, then 2 $\cong$ segs
③ $\angle SWY \cong \angle ONY$	③ Given
④ $\angle 1 \cong \angle 2$	④ If VA, then $\cong$ $\angle$s
⑤ $\triangle SYW \cong \triangle ONY$	⑤ ASA (3,2,4)
⑥ $\overline{SW} \cong \overline{NO}$	⑥ CPCTC
⑦ $\overline{SW} \parallel \overline{NO}$	⑦ If alt. int $\angle$s $\cong$, then $\parallel$ lines
⑧ SNOW is a ▱	⑧ If both pairs of opp sides $\cong$, then ▱.

2. What is the value of x if SNOW is a rectangle?

$42 + 2x + 6 = 90$
$2x + 48 = 90$
$2x = 42$
$x = 21$



3. Given: CANE is a rectangle
$AS = x^2$
$NS = 2x + 8$
Find: CN



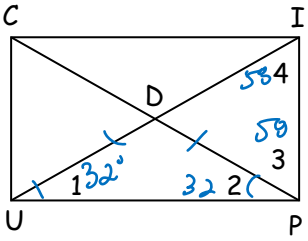
$x^2 = 2x + 8$
$x^2 - 2x - 8 = 0$
$(x - 4)(x + 2) = 0$
$x = 4, -2$

CN = 36 or 8

$4^2 = (16)2$
$= 36$
$(-2)^2 = 4 - 2$
$= 8$

4. Draw a counterexample to disprove the statement "If two sides of a quadrilateral are perpendicular, then the quadrilateral is a rectangle."

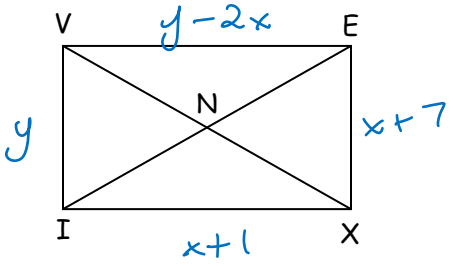
5. If CUPI is a rectangle and $m\angle 1 = 32°$, find the $m\angle 2$, $m\angle 3$, $m\angle 4$.



$m\angle 2 = 32°$

$m\angle 3 = m\angle 4 = 58°$

6. Given: VIXE is a rectangle, VI = y
EX = x + 7, VE = y – 2x, IX = x + 1
Solve for x and y.



$y-2x=x+1 \rightarrow y-3x=1$

$y=x+7$

$x+7-3x=1$

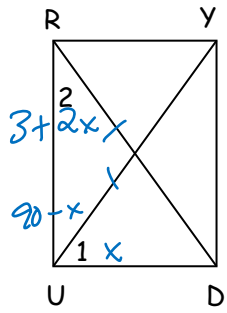
$-2x=-6$

$x=3$

$y=3+7$

$y=10$

7. If RUDY is a rectangle and the measure of ∠2 is three more than twice the measure of ∠1, find the measure of the two angles.



$3+2x=90-x$

$3x=87$

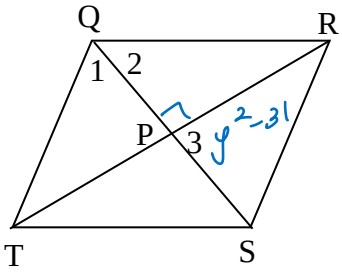
$x=29$

$m\angle 1 = 29°$

$m\angle 2 = 61°$

Part 3: Rhombuses

8. Given: *QRST* is a rhombus
$m\angle 3 = y^2 - 31$
Find: the value(s) of y = ±11

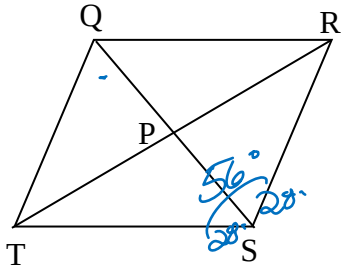


$y^2-31=90$

$\sqrt{y^2}=\sqrt{121}$

$y=\pm 11$

9. Given: *QRST* is a rhombus
$m\angle RST = 56$
Find: $m\angle TQS$ = 28°

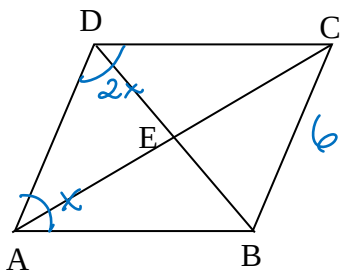


10. Given: Rhombus *ABCD*
$m\angle DAB = 2(m\angle ADC)$
$CB = 6$
Find: a. $m\angle ACD$ = 30°
b. $m\angle DAB$ = 60°
c. *DA* = 6

$2x+x=180$

$3x=180$

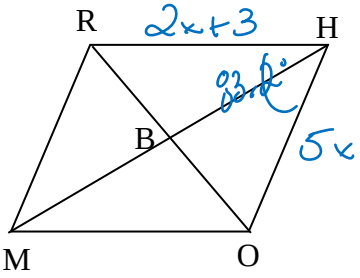
$x=60$



d. $m\angle ADB$ = _____

11. Given: Rhombus RHOM
$RH = 2x+3$
$HO = 5x$

Find: a. x = 1
b. RM = 5
c. $m\angle RBH$ = 90°
d. $m\angle HOM$ if $m\angle RHO = 83.2$

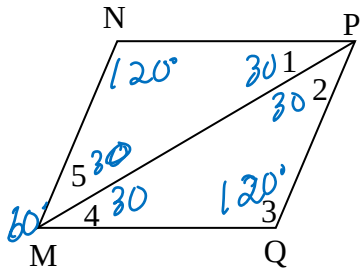


$180 - 83.2$ 96.8°

$2x+3=5x$
$3=3x$
$1=x$

12. *MNPQ* is a rhombus and $m\angle N = 120$. Find the measures of the numbered angles.

$m\angle 1 = m\angle 2 = m\angle 4 = m\angle 5 = 30°$
$m\angle 3 = 120°$



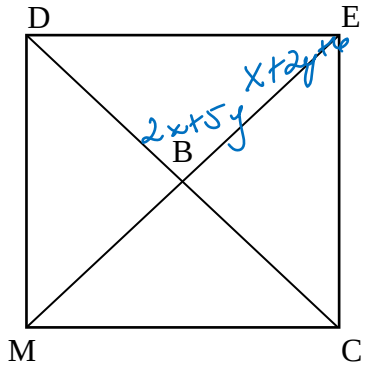
Part 4: Squares

Use the diagram of square DECM at the right for #13– 15.

13. If DE = 2x + 4 and EC = 3x – 5, find MC.

$2x+4=3x-5$
$9=x$

$2(9)+4$
$18+4$
22



14. If DM = x^2 – 15 and EC = 2x, find x.

$x^2 - 15 = 2x$
$x^2 - 2x - 15 = 0$
$(x-5)(x+3)=0$

$x = 5, -3$

15. If m∠DEB = x + 2y + 6 and m∠EBD = 2x + 5y, solve for x and y.

$2x+5y=90$
$2(x+2y+6)=90$
$2x+4y+12=90$
$2x+4y=78$

$-(2x+5y=90)$
$2x+4y=78$
$-2x-5y=-90$
$-y=-12$
$y=12$