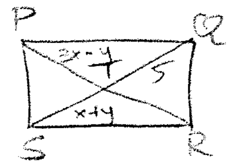
# Chapter 5 Review Key

## I

1.) 



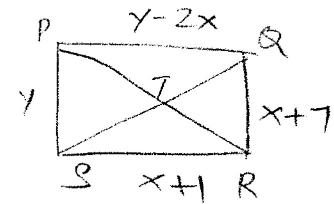

$x+y=5 \quad -①$

$3x-y=5 \quad -②$

$① + ② \Rightarrow 4x = 10$

$x = \boxed{\frac{5}{2}}$

$y = 5 - \frac{5}{2} = \boxed{\frac{5}{2}}$




2.) $y-2x = x+1$

$y - 3x = 1 \quad -①$

$x + 7 = y$

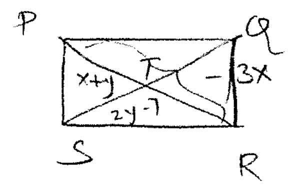
$x - y = -7 \quad -②$

$① + ② \Rightarrow -2x = -6$

$\boxed{x = 3}$

$\boxed{y = x+7 = 10}$

3) 




$x+y = 2y-7$

$x = y-7 \quad -①$

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

$4x + 3y = 7 \quad -②$

① in ② $\Rightarrow$

$4(y-7) + 3y = 7$

$4y - 28 + 3y = 7$

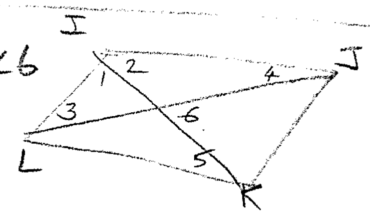
$7y = 35$

$\boxed{y = 5}$

$\boxed{x = y-7 = -2}$

## II

4) $m\angle 3 = 62^\circ$, find $m\angle 1$, $m\angle 4$, and $m\angle 6$




$m\angle 4 = m\angle 3 = 62$

$180 - 124 = 56$

$m\angle 1 = \frac{56}{2} = 28$ ; $m\angle 6 = 90^\circ$

5.) $m\angle 3 = 2x+30$, $m\angle 4 = 3x-1$, find $x$

$m\angle 3 = m\angle 4$

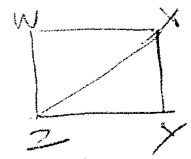
$2x + 30 = 3x - 1$

$\boxed{31 = x}$

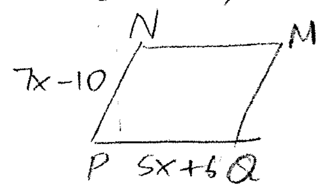
$\rightarrow$ figure does not exist in real life! ①

6.) $m\angle 3 = 4(x+1)$, $m\angle 5 = 2(x+1)$

$$4(x+1) + 2(x+1) = 90^\circ$$
$$6x + 6 = 90^\circ$$
$$6x = 84$$
$$\boxed{x = 14}$$

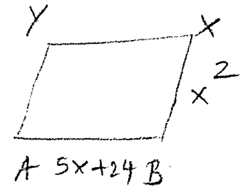



III. 7.) $m\angle ZXY = 45^\circ$



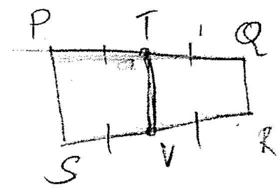

8.) $7x - 10 = 5x + 6$

$$2x = 16$$
$$\boxed{x = 8}$$




9.) $x^2 = 5x + 24$

$$x^2 - 5x - 24$$
$$(x-8)(x+3) = 0$$
$$\boxed{x = 8, -3}$$




IV. 10.) $PS = 20$, $QR = 14$

$$TV = \frac{1}{2}(20 + 14) \boxed{= 17}$$

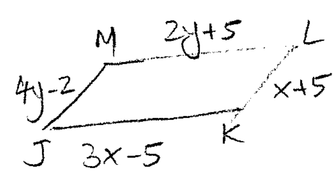
11.) $QR = 14.3$, $TV = 23.2$

$$TV = \frac{1}{2}(14.3 + PS)$$
$$\boxed{PS = 46.2 - 14.3 = 32.1}$$

13.) $\boxed{m\angle TPS = 180 - a}$

12.) $x + 7 = \frac{1}{2}(5x + 2)$

$$2x + 14 = 5x + 2$$
$$12 = 3x$$
$$\boxed{x = 4}$$




V. 14.) $4y - 2 = x + 5$

$$x = 4y - 7 \quad \text{—} (1)$$
$$2y + 5 = 3x - 5$$
$$2y - 3x = -10 \quad \text{—} (2)$$
$$(1) \text{ in } (2) \Rightarrow 2y - 3(4y - 7) = -10$$
$$2y - 12y + 21 = -10$$

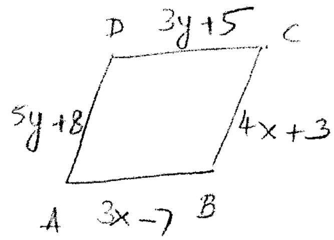
$$-10y = -31$$
$$\boxed{y = 3.1}$$
$$x = 4(31) - 7$$

15) $3y+5 = 3x-7$

$3y - 3x = -12$ — (1)

$5y + 8 = 4x + 3$

$x = \dfrac{5y+5}{4}$ — (2)




(2) in (1) $\Rightarrow 3y - 3\left(\dfrac{5y+5}{4}\right) = -12$

$12y - 15y - 15 = -48$

$-3y = -33$

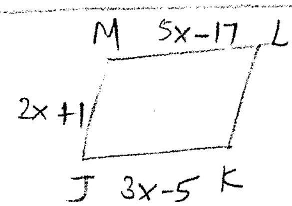
$\boxed{y = 11}$

$\boxed{x = \dfrac{5(11)+5}{4} = 15}$

16.) $5x - 17 = 3x - 5$

$2x = 12$

$x = 6$




$5x - 17 = 5(6) - 17 = 13$

$2x + 1 = 2(6) + 1 = 13$

Since, consecutive sides of the ▱ are ≅, it is a rhombus

VI 17.) $QM = 13$, $\boxed{FY = 26}$

18) $m\angle YBF = 52 \times 2 = \boxed{104}$

19.) $3x - 7 = x + 3$

$2x = 10$

$x = 5$

$\therefore x + 3 = 8$

$\boxed{QB = 8 \cdot 2 = 16}$

VII 20) $24 = \frac{1}{2}(18 + SR)$

$\boxed{SR = 48 - 18 = 30.}$

21) $TU = \frac{1}{2}(9+15) = 12$

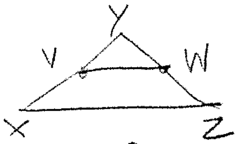
22) $24 = \frac{1}{2}(3x+4+5x+8)$

$48 = 8x+12$

$\boxed{\frac{9}{2} = \frac{36}{8} = x}$ $SR = 5\left(\frac{9}{2}\right)+8$

$= \boxed{\frac{61}{2}}$

VII. 23)

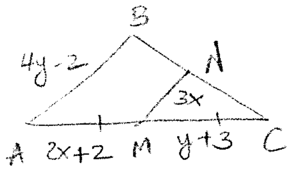



$x-5 = \frac{1}{2}(x+6)$

$2x-10 = x+6$

$\boxed{x = 16}$

24)




$2x+2 = y+3$

$2x-1 = y$ — ①

$2(3x) = 4y-2$ — ②

①in②

$\Rightarrow 6x-4(2x-1) = -2$

$6x-8x+4 = -2$

$-2x = -6$

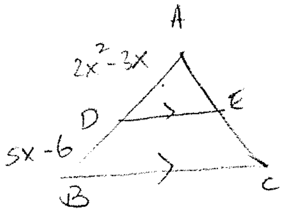
$x = 3$

$y = 2(3)-1 = 5$

$\boxed{AB = 4y-2 = 4(5)-2 = 18}$

$\boxed{MN = 3(3) = 9}$

25)




$2x^2-3x = 5x-6$

$2x^2-8x+6 = 0$

$x^2-4x+3 = 0$

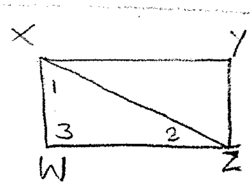
$(x-3)(x-1) = 0$

$x = 3$, 1 reject $\rightarrow DB = -1$

$AB = 2(5x-6) = 2(5\cdot3-6) = \boxed{18}$

IX. 1) Given: ▱WXYZ; ∠1 comp. ∠2

Prove: WXYZ is a rectangle




① ∠1 comp ∠2 → ② $m\angle1 + m\angle2 = 90°$

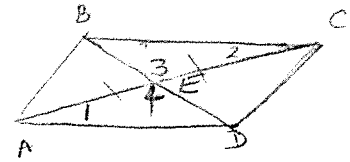
③ $m\angle1 + m\angle2 + m\angle3 = 180°$ → ④ $90 + m\angle3 = 180°$

⑤ $m\angle3 = 90°$ → ⑥ ∠3 is right

⑦ ▱WXYZ → ⑧ WXYZ is a rectangle

Reasons

7) ① Given ② Def of comp. ∠s ③ Sum of ∠s in a △ is 180° ④ Substitution property ⑤ Subtraction property ⑥ Def of a right ∠ ⑧ One angle of a ▱ is right → Rectangle




2) Given: $\angle 1 \cong \angle 2$

$\overrightarrow{BD}$ bisects $\overline{AC}$ at E

Prove: ABCD is a ▱

1. $\overrightarrow{BD}$ bisects $\overline{AC}$ at E → 2. E midpoint of $\overline{AC}$ → 3. $AE \cong EC$

4. $\angle 1 \cong \angle 2$

4.5. $\angle 3$ & $\angle 4$ are vertical $\angle$s → 5. $\angle 3 \cong \angle 4$

6. $\triangle BEC \cong \triangle DEA$ → 7. $\overline{BC} \cong \overline{AD}$

8. $\angle 1 \cong \angle 2$ → 9. $\overline{BC} \parallel \overline{AD}$

8.5. $\angle 1$ & $\angle 2$ are alt. int $\angle$s

10. ABCD is a ▱

Reasons

1, 4, 8 Given

2 Def of segment bisector

3 Def of a midpoint

5 Vertical Angles Theorem

6 ASA postulate

7 CPCTC

9 Alt int. $\angle$s $\cong$ → lines $\parallel$

10 One set of opp sides $\cong$ & $\parallel$ → ▱

4.5 Def of vertical $\angle$s

8.5 Def of alt. int. $\angle$s