Answers: Chapter 5 Review

(1) $3x - y = 5$

$\underline{x + y = 5}$

$4x = 10$

$x = \frac{10}{4} = 5/2$

$\frac{5}{2} + y = 5$

$y = 5/2$

$\boxed{\left(\frac{5}{2}, \frac{5}{2}\right)}$

(2) $y = x + 7$ $-1(y - x = 7)(-1)$ $-y + x = -7$

$y - 2x = x + 1$ $\underline{y - 3x = 1}$ $\underline{y - 3x = 1}$

$\boxed{(3, 10)}$ $-2x = -6$

$x = 3$

$y = 3 + 7 = 10$

(3) $x + y + x + y = -3x$ $2x + 2y = -3x$ $-2(5x + 2y = 0)(-2)$ $-10x - 4y = 0$

$2y - 7 + 2y - 7 = -3x$ $3x + 4y = 14$ $\underline{3x + 4y = 14}$ $\underline{3x + 4y = 14}$

$-7x = 14$

$x = -2$

$5(-2) + 2y = 0$

$2y = 10$

$y = 5$

$\boxed{(-2, 5)}$

(4) $180 - 124 = 56$ $m\angle IJ = 56$ $\underline{m\angle 1 = 28}$, $\underline{m\angle 4 = 62}$; $m\angle 6 = 180 - 28 - 62 = \underline{90}$

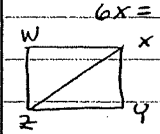
(5) $2x + 30 = 3x - 1$ $x = 31$

(6) $4(x + 1) + 2(x + 1) = 90$

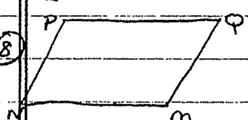
$4x + 4 + 2x + 2 = 90$ $x = 14$

$6x + 6 = 90$

$6x = 84$

(7) 

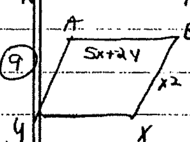
$m\angle ZXY = \frac{1}{2}(90) = \underline{45}$

(8) 

$7x - 10 = 5x + 6$

$2x = 16$

$x = 8$

(9) 

$x^2 = 5x + 24$

$x^2 - 5x - 24 = 0$

$(x - 8)(x + 3) = 0$

$x - 8 = 0$ $x + 3 = 0$

$x = 8$ $x = -3$

(10) $\frac{1}{2}(20 + 14) = \frac{1}{2}(34) = 17$

$TV = 17$

(11) $\underline{23.2} = \frac{1}{2}(14.3 + x)$

$46.4 = 14.3 + x$

$32.1 = x$

$\boxed{PS = 32.1}$

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

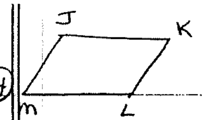
$2x + 14 = 5x + 2$

$12 = 3x$

$4 = x$

(13) If $m\angle VTP = a$

then $m\angle TPS = 180 - a$

(14) 

$\underline{3x - 5 = 2y + 5}$

$3x - 2y = 10$

$3x - 2y = 10$

$\underline{-3x + 12y = 21}$

$10y = 31$

$y = 3.1$

$\underline{x + 5 = 4y - 2}$

$x - 4y = -7$

$x - 4(3.1) = -7$

$x - 12.4 = -7$

$x = 5.4$

$3x - [illegible] = 10$

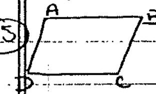
$-3(x - 4y) = (-7)(-3)$

$JK = 3(5.4) - 5 = 16.2 - 5 = 11.2$

$LM = 2(3.1) + 5 = 6.2 + 5 = 11.2$

$KL = 5.4 + 5 = 10.4$

$JM = 4(3.1) - 2 = 12.4 - 2 = 10.4$

(15) 

$3x - 7 = 3y + 5$

$3x - 3y = 12$

Divide each term by 3

$x - y = 4$

$5y + 8 = 4x + 3$

$-4x + 5y = -5$

$-4x + 5y = -5$

$5(x - y) = (4)5$

$15 - y = 4$

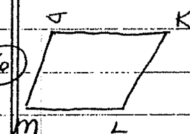
$-y = -11$

$y = 11$

$-4x + 5y = -5$

$\underline{5x - 5y = 20}$

$x = 15$

(16) 

$3x - 5 = 5x - 17$

$12 = 2x$

$6 = x$

$JK = 3(6) - 5 = 18 - 5 = \underline{13}$

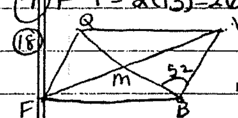
$JM = 2x + 1$

$JM = 2(6) + 1$

$JM = 12 + 1 = \underline{13}$

JKLM is a ▱. JK = JM which means $\overline{JK} \cong \overline{JM}$. Since 2 consecutive sides of a ▱ are $\cong$ the ▱ is a rhombus.

(17) $FY = 2(13) = 26$

(18) 

$m\angle YBF = 2(52) = 104$

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

$2x = 10$

$x = 5$

$QM = 3(5) - 7$

$= 15 - 7 = 8$

$QB = 2(8) = 16$

(20) Let $x = SR$

$24 = \frac{1}{2}(x + 18)$

$48 = x + 18$

$30 = x$

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

$TU = \frac{1}{2}(24) = 12$

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

$48 = 8x + 12$

$36 = 8x$

$4.5 = x$

$SR = 5(4.5) + 8$

$= 22.5 + 8$

$\boxed{SR = 30.5}$

(23) $x -$ [illegible] $= \frac{1}{2}(x+6)$

$2x-10 = x+6$

$x = 16$

$VW = 16-5 = 11$

(24) $2x+2 = y+3$

$\boxed{2x-y=1}$

$-2(2x-y=1)(-2)$

$3x-2y=-1$

$3x = \frac{1}{2}(4y-2)$

$3x = 2y-1$

$\boxed{3x-2y=-1}$

$-4x+2y=-2$

$3x-2y=-1$

$-x=-3$

$x=3$

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

$9-2y=-1$

$-2y=-10$

$y=5$

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

$\boxed{AB = 4(5)-2 = 20-2 = 18}$

(25) $2x^2-3x = 5x-6$

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

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

$2(x-3)(x-1)=0$

$x-3=0$ $\quad$ $x-1=0$

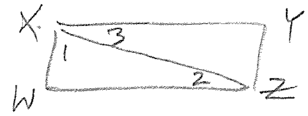
$x=3$ $\quad$ $\cancel{x=1}$ reject

$AD = 2(9)-9 = 18-9 = 9$

$DB = 5(3)-6 = 15-6 = 9$

$AB = 9+9 = 18$

IX. Proofs



① ▱ WXYZ → ② $\overline{XY} \parallel \overline{WZ}$ → ③ $\angle 3 \cong \angle 2$ → ⑥ $m\angle 3 = m\angle 2$

④ $\angle 1$ & $\angle 2$ complement → ⑤ $m\angle 1 + m\angle 2 = 90$

→ ⑦ $m\angle 1 + m\angle 3 = 90.$

⑧ $m\angle WXY = m\angle 1 + m\angle 3$

→ ⑨ $m\angle WXY = 90$

→ ⑩ $\angle WXY$ is Rt.

▱ WXYZ

→ ⑪ WXYZ is a rect.

① Given
② ▱ → opp sides ∥
③ 2 ∥ lines → alt. int. $\angle$s $\cong$.
④ Given
⑤ def of compl. $\angle$s.
⑥ def of $\cong$ $\angle$s.
⑦ Substitution Prop.
⑧ Angle Addition Post.
⑨ Substitution Prop.
⑩ def of Rt $\angle$
⑪ A ▱ with 1 rt. $\angle$s is a rectangle.

OR

① $\angle 1$ & $\angle 2$ complement. → ② $m\angle 1 + m\angle 2 = 90$

③ $m\angle 1 + m\angle 2 + m\angle W = 180$

→ ④ $90 + m\angle W = 180$

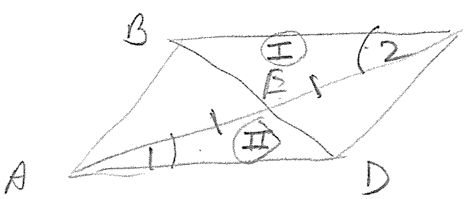
→ ⑤ $m\angle W = 90$ → ⑥ $\angle W$ is Rt.

⑦ ▱ WXYZ

→ ⑧ WXYZ is a rectangle.

① Given
② def of complementary $\angle$s
③ meas. of 3 $\angle$s of Δ is 180.
④ Substitution Prop.
⑤ Subtraction Prop.
⑥ def of Rt. $\angle$
⑦ Given
⑧ A ▱ with a right $\angle$ is a rectangle

(2)



$\triangle I$ is $\triangle BEC$
$\triangle II$ is $\triangle DEA$

<u>Plan</u>
Can show $\triangle I \cong \triangle II$ to get $\overline{BC} \cong \overline{AD}$.
Then use the method: If 1 pair opp sides are both $\cong$ & $\parallel \rightarrow \boxed{P}$.

(1) $\overline{BD}$ bisects $\overline{AC}$ at E. $\rightarrow$ (2) $\overline{AE} \cong \overline{EC}$
(3) $\measuredangle BEC \cong \measuredangle DEA$
(4) $\measuredangle 1 \cong \measuredangle 2$
$\rightarrow$ (5) $\triangle BEC \cong \triangle DEA$

$\rightarrow$ (6) $\overline{BC} \cong \overline{AD}$
$\rightarrow$ (7) $\overline{BC} \parallel \overline{AD}$
$\rightarrow$ (8) ABCD is a $\boxed{P}$

(1) Given
(2) def. of segment bisector
(3) Vertical $\measuredangle$s $\cong$.
(4) Given
(5) ASA thm
(6) CPCTC
(7) If 2 lines w/ alt. int. $\measuredangle$s $\cong \rightarrow$ 2 $\parallel$ lines.
(8) If 1 pair of sides are $\cong$ & $\parallel \rightarrow$ a $\boxed{P}$