5.1 HW Properties of Parallelograms Name: Key

Algebra The perimeter of $\square PQRS$ is 84. Find the length of each side of $\square PQRS$ under the given conditions.

27. $PQ = QR$

$PQ = QR = RS = SP = 21$

28. $QR = 3(RS)$

$PQ = RS = 10.5$;
$QR = SP = 31.5$

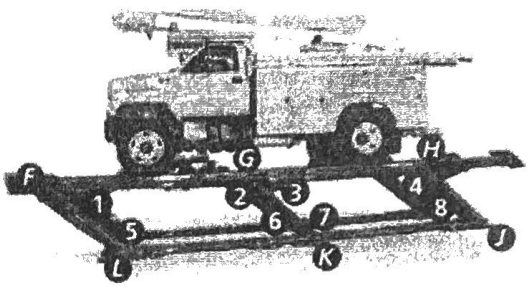
29. $RS = SP - 7$

$PQ = RS = 17.5$
$QR = SP = 24.5$

30. $SP = RS^2$

$PQ = RS = 6$
$QR = SP = 36$

31. **Cars** To repair a large truck, a mechanic might use a *parallelogram lift*. In the lift, $\overline{FG} \cong \overline{GH} \cong \overline{LK} \cong \overline{KJ}$, and $\overline{FL} \cong \overline{GK} \cong \overline{HJ}$.



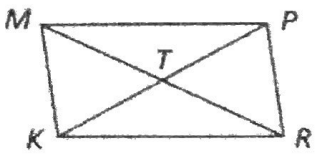
a. Which angles are congruent to $\angle 1$? Justify your answer.

b. What is the relationship between $\angle 1$ and each of the remaining labeled angles? Justify your answer.

a) $\angle 3 \cong \angle 1$ (corresponding $\angle$'s)
$\angle 6 \cong \angle 1$ (opposite $\angle$'s are $\cong$)
$\angle 8 \cong \angle 1$ (opposite $\angle$'s are $\cong$)

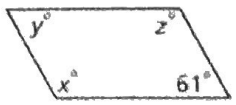
b) $\angle 2$ is supp to $\angle 1$ (consecutive $\angle$'s)
$\angle 4$ is supp to $\angle 1$ (cons. $\angle$'s)
$\angle 5$ is supp to $\angle 1$ (consecutive $\angle$'s)
$\angle 7$ is supp to $\angle 1$ (Substitution)

Complete each statement about $\square KMPR$. Justify your answer.

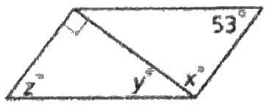


32. $\angle MPR \cong$ $\angle RKM$
33. $\angle PRK \cong$ $\angle KMP$
34. $\overline{MT} \cong$ $\overline{RT}$
35. $\overline{PR} \cong$ $\overline{KM}$
36. $\overline{MP} \parallel$ $\overline{RK}$
37. $\overline{MK} \parallel$ $\overline{RP}$
38. $\angle MPK \cong$ $\angle RKP$
39. $\angle MTK \cong$ $\angle RTP$
40. $m\angle MKR + m\angle PRK =$ 180°

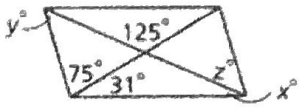
Find the values of x, y, and z in each parallelogram.

41. 

$x = 119°$
$y = 61°$
$z = 119°$

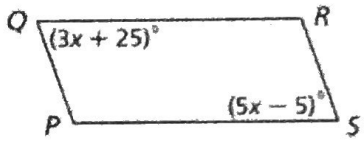
42. 

$x = 90°$
$y = 37°$
$z = 53°$

43. 

$x = 24°$
$y = 50°$
$z = 50°$

51. What is the value of x in $\square PQRS$?



(A) 15 (C) 30
(B) 20 (D) 70

52. The diagonals of $\square JKLM$ intersect at Z. Which statement is true?

(F) $JL = KM$ (G) $JL = \frac{1}{2}KM$ (H) $JL = \frac{1}{2}JZ$ (J) $JL = 2JZ$

53. **Gridded Response** In $\square ABCD$, $BC = 8.2$, and $CD = 5$. What is the perimeter of $\square ABCD$?

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