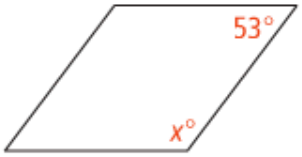
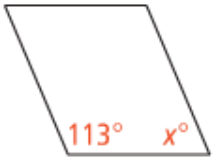
Algebra Find the value of x in each parallelogram.

See Problem 1.

9.

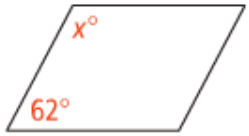


10.



11.

12.

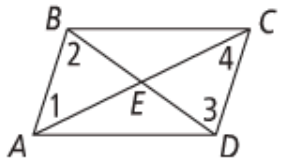


13. Developing Proof Complete this two-column proof of Theorem 6-6.

See Problem 2.

Given: $\square ABCD$

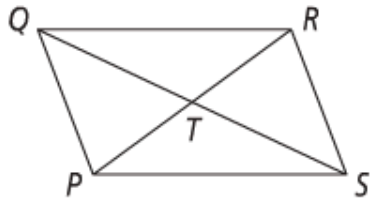
Prove: $\overline{AC}$ and $\overline{BD}$ bisect each other at E.



Statements	Reasons
1) $ABCD$ is a parallelogram.	1) Given
2) $\overline{AB} \parallel \overline{DC}$	2) a. ?
3) $\angle 1 \cong \angle 4$; $\angle 2 \cong \angle 3$	3) b. ?
4) $\overline{AB} \cong \overline{DC}$	4) c. ?
5) d. ?	5) ASA
6) $\overline{AE} \cong \overline{CE}$; $\overline{BE} \cong \overline{DE}$	6) e. ?
7) f. ?	7) Definition of bisector

Algebra Find the values of x and y in $\square PQRS$.

See Problem 3.



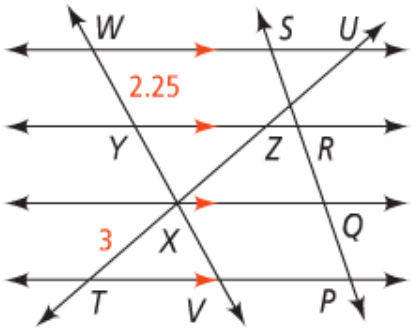
14. $PT = 2x$, $TR = y + 4$, $QT = x + 2$, $TS = y$

15. $PT = x + 2$, $TR = y$, $QT = 2x$, $TS = y + 3$

16. $PT = y$, $TR = x + 3$, $QT = 2y$, $TS = 3x - 1$

In the figure, $PQ = QR = RS$. Find each length.

See Problem 4.



17. ZU

18. XZ

19. TU

20. XV

21. YX

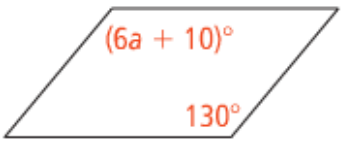
22. YV

23. WX

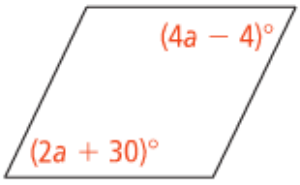
24. WV

Algebra Find the value(s) of the variable(s) in each parallelogram.

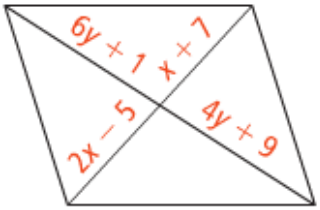
25.



26.



27.

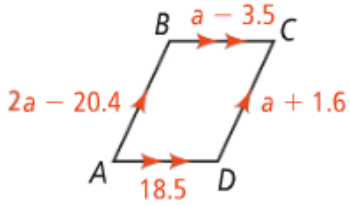


28. Think About a Plan What are the values of x and y in the parallelogram?

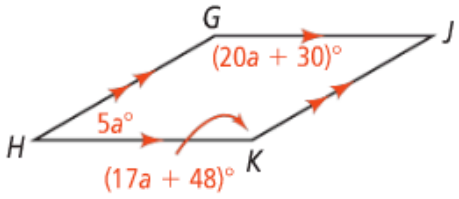
- How are the angles related?
- Which variable should you solve for first?

Algebra **Find the value of a. Then find each side length or angle measure.**

29.



30.



31. Studio Lighting A pantograph is an expandable device shown at the right. Pantographs are used in the television industry in positioning lighting and other equipment. In the photo, points D, E, F, and G are the vertices of a parallelogram. $\square DEFG$ is one of many parallelograms that change shape as the pantograph extends and retracts.

a. If $DE = 2.5$ ft, what is FG? **b.** If $m\angle E = 129$, what is $m\angle G$?

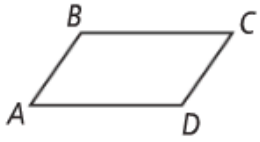
c. What happens to $m\angle D$ as $m\angle E$ increases or decreases? Explain.

32. Prove Theorem 6-4.

Proof

Given: $\square ABCD$

Prove: $\angle A$ is supplementary to $\angle B$.
$\angle A$ is supplementary to $\angle D$.



Use the diagram at the right for each proof.

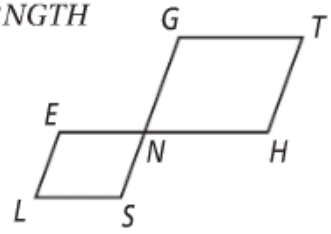
Proof

33. Given: $\square LENS$ and $\square NGTH$

Prove: $\angle L \cong \angle T$

34. Given: $\square LENS$ and $\square NGTH$

Prove: $\overline{LS} \parallel \overline{GT}$



35. Given: $\square LENS$ and $\square NGTH$

Prove: $\angle E$ is supplementary to $\angle T$.

Use the diagram at the right for each proof.

Proof

36. Given: $\square RSTW$ and $\square XYTZ$

Prove: $\angle R \cong \angle X$

37. Given: $\square RSTW$ and $\square XYTZ$

Prove: $\overline{XY} \parallel \overline{RS}$