Exploring Angle Pairs

🔊 Vocabulary

● Review

Use a word from the list below to complete each sentence. Use each word just once.

    interior   rays   vertex

1. The __?__ of an *angle* is the region containing all of the points between the two sides of the angle.

2. When you use three points to name an *angle,* the __?__ must go in the middle.

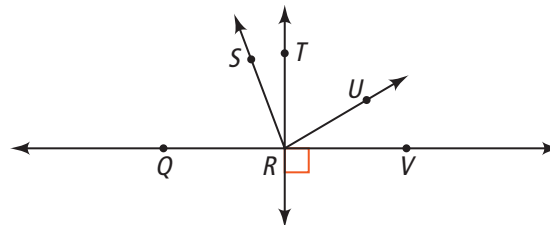**3.** The sides of ∠QRS are __?__ RS and RQ.

Use the figure below for Exercises 4–7. Identify each angle as *acute, right, obtuse,* or *straight*.

4. ∠SRV   **5.** ∠TRS

6. ∠TRQ   **7.** ∠VRQ

● Vocabulary Builder

conclusion (noun) **kun KLOO zhun**

Other Word Forms: conclude (verb)

Definition: A **conclusion** is the end of an event or the last step in a reasoning process.

● Use Your Vocabulary

Complete each sentence with *conclude* or *conclusion*.

8. If it rains, you can __?__ that soccer practice will be canceled.

9. The last step of the proof is the __?__ .

take note

Key Concept   Types of Angle Pairs

Angle Pair	Definition
Adjacent angles	Two coplanar angles with a common side, a common vertex, and no common interior points
Vertical angles	Two angles whose sides are opposite rays
Complementary angles	Two angles whose measures have a sum of 90
Supplementary angles	Two angles whose measures have a sum of 180

Draw a line from each word in Column A to the angles it describes in Column B.

Column A

10. supplementary

11. adjacent

12. vertical

13. complementary

Column B
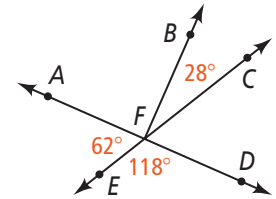
∠1 and ∠2

∠2 and ∠3

∠2 and ∠5

∠3 and ∠6
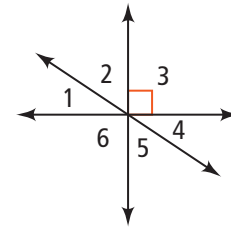
✔ **Problem 1** **Identifying Angle Pairs**

Got It? Use the diagram at the right. Are ∠AFE and ∠CFD vertical angles? Explain.

14. The rays of ∠AFE are $\overrightarrow{FE}$ and $\overrightarrow{FC}$ / $\overrightarrow{FA}$.

15. The rays of ∠CFD are $\overrightarrow{FC}$ and $\overrightarrow{FD}$ / $\overrightarrow{FA}$.

Complete each statement.

16. $\overrightarrow{FE}$ and ⬜ are opposite rays.

17. $\overrightarrow{FA}$ and ⬜ are opposite rays.

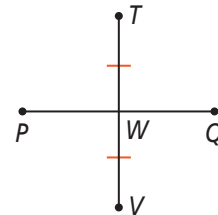**18.** Are ∠AFE and ∠AFE vertical angles?   Yes / No

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✔ **Problem 2** **Making Conclusions From a Diagram**

Got It? Can you conclude that $\overline{TW} \cong \overline{WV}$ from the diagram? Explain.

19. Circle the items marked as congruent in the diagram.

$\overline{PW}$ and $\overline{WQ}$ $\overline{TW}$ and $\overline{WV}$

∠TWQ and ∠PWT   ∠TWQ and ∠VWQ

20. Can you conclude that $\overline{TW} \cong \overline{WV}$? Why or why not?

Lesson 1-5

take note

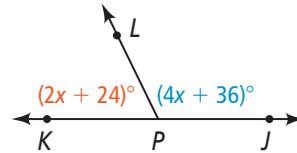### Postulate 1–9 Linear Pair Postulate

If two angles form a linear pair, then they are supplementary.

21. If $\angle A$ and $\angle B$ form a linear pair, then $m\angle A + m\angle B = $ ⬚ .

Problem 3 **Finding Missing Angle Measures**

Got It? **Reasoning** $\angle KPL$ and $\angle JPL$ are a linear pair, $m\angle KPL = 2x + 24$, and $m\angle JPL = 4x + 36$. **How can you check that** $m\angle KPL = 64$ **and** $m\angle JPL = 116$?

$(2x + 24)°$ $(4x + 36)°$
K   P   J   L

22. What is one way to check solutions? Place a ✓ in the box if the response is correct. Place an ✗ in the box if it is incorrect.

⬚ Draw a diagram. If it looks good, the solutions are correct.

⬚ Substitute the solutions in the original problem statement.

23. Use your answer(s) to Exercise 22 to check the solutions.

24. How does your check show that you found the correct angle measurements?

Problem 4 **Using an Angle Bisector to Find Angle Measures**

Got It? $\overrightarrow{KM}$ bisects $\angle JKL$. If $m\angle JKL = 72$, what is $m\angle JKM$?

25. Write a justification for each step.

$m\angle JKM = m\angle MKL$
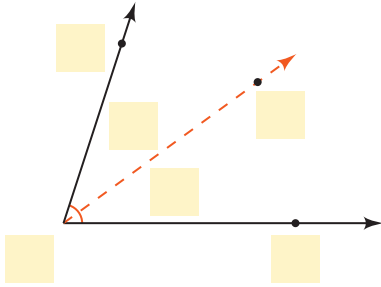
$m\angle JKM + m\angle MKL = m\angle JKL$

$2m\angle JKM = m\angle JKL$

$m\angle JKM = \frac{1}{2}m\angle JKL$

26. Complete.

$m\angle JKL = $ ⬚ , so $m\angle JKM = $ ⬚ .

27. Now complete the diagram below.

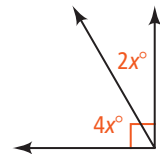## Lesson Check • Do you UNDERSTAND?

Error Analysis Your friend calculated the value of *x* below. What is her error?

4x + 2x = 180
6x = 180
x = 30

$2x°$
$4x°$

28. Circle the best description of the largest angle in the figure.

acute   obtuse   right   straight

29. Complete: $4x + 2x = $ ⬚

30. What is your friend's error? Explain.

_____

_____

_____

Math Success

Check off the vocabulary words that you understand.

☐ angle   ☐ complementary   ☐ supplementary   ☐ angle bisector   ☐ vertical

Rate how well you can *find missing angle measures.*

Need to review   0   2   4   6   8   10   Now I get it!

Lesson 1-5