

Angles Formed by Intersecting Lines

Practice and Problem Solving: A/B

Use the figures for Problems 1-5.

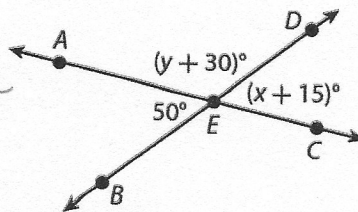
1. supplement of $\angle AEB$

$\angle AED$ or $\angle BEC$

$$x + 15 = 50$$

2. $x = \underline{35}$

3. $y = \underline{100}$



$$y + 30 + 50 = 180$$

4. $m\angle DEC = \underline{50}$

5. $m\angle AED = \underline{130}$

6. $\angle DEF$ and $\angle FEG$ are complementary. $m\angle DEF = (3x - 4)^\circ$, and $m\angle FEG = (5x + 6)^\circ$.

Find the measures of both angles.

$$m\angle DEF = 3(11) - 4 = 29$$

$$m\angle FEG = 5(11) + 6 = 61$$

$$3x - 4 + 5x + 6 = 90$$

$$8x + 2 = 90$$

$$8x = 88$$

$$x = 11$$

7. $\angle DEF$ and $\angle FEG$ are supplementary. $m\angle DEF = (9x + 1)^\circ$, and $m\angle FEG = (8x + 9)^\circ$.

Find the measures of both angles.

$$m\angle DEF = 9(10) + 1 = 91$$

$$m\angle FEG = 8(10) + 9 = 89$$

$$9x + 1 + 8x + 9 = 180$$

$$17x + 10 = 180$$

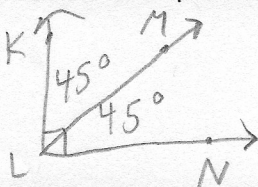
$$17x = 170$$

$$x = 10$$

8. $\angle ABC$ and $\angle CBD$ form a linear pair and have equal measures. Tell if $\angle ABC$ is acute, right, or obtuse.

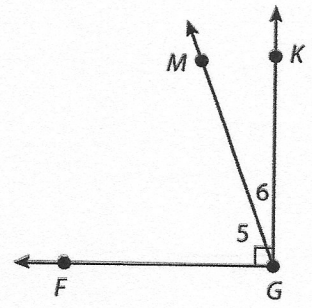
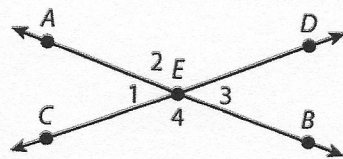
They add to 180 and are equal, so they must both be $90^\circ \rightarrow$ right

9. $\angle KLM$ and $\angle MLN$ are complementary. \overline{LM} bisects $\angle KLN$. Find the measures of $\angle KLM$ and $\angle MLN$.



Use the terms and the diagrams below to answer Problems 10–13.
Notice that more than one term can be used for some questions.

Terms:
linear pair
supplementary angles
complementary angles
right angle
vertical angles



10. $\angle 5$ and $\angle 6$ are complementary and adjacent angles.
 11. $\angle 1$ and $\angle 3$ are vertical.
 12. $\angle 1$ and $\angle 2$ are linear pair and supplementary.
 13. $\angle FGK$ is a right angle.

In Exercises 14–19, find the angle measure.

14. $\angle 1$ is a complement of $\angle 2$, and $m\angle 1 = 23^\circ$. Find $m\angle 2$.
 $90 - 23 = 67^\circ$

15. $\angle 3$ is a complement of $\angle 4$, and $m\angle 3 = 46^\circ$. Find $m\angle 4$.
 $90 - 46 = 44^\circ$

16. $\angle 5$ is a supplement of $\angle 6$, and $m\angle 5 = 78^\circ$. Find $m\angle 6$.
 $180 - 78 = 102^\circ$

17. $\angle 7$ is a supplement of $\angle 8$, and $m\angle 7 = 109^\circ$. Find $m\angle 8$.
 $180 - 109 = 71^\circ$

18. $3x + 5 + 10x - 7 = 180$
 $13x - 2 = 180$
 $13x = 182$
 $x = 14$

19. $15x - 2 + 7x + 4 = 90$
 $22x + 2 = 90$
 $22x = 88$
 $x = 4$

Name the relationship between the angles, and then find the angle measure.

20. $m\angle 1$

same side int
 47°

21. $m\angle 2$

Corresp.
 119°

22. $m\angle ABC$

none
 97°

23. $m\angle DEF$

alt. int.
 $8x - 34 = 5x + 2$
 $3x = 36$
 $x = 12$

$m\angle DEF = 5(12) + 2 = 62$

24. Solve for x.

$43 + x + 24 = 180$
 $x + 67 = 180$
 $x = 113$

In Exercises 25 - 28, find the value of x or y. Show your steps.

25.

Corresp.
 $6x - 11 = 37$
 $6x = 48$
 $x = 8$

26.

$2(x + 9) + 142 = 180$
 $2x + 18 + 142 = 180$
 $2x + 160 = 180$
 $2x = 20$
 $x = 10$

27.

alt. int.
 $2x = 128$
 $x = 64$

28.

same side int
 $7x + 24 + 72 = 180$
 $7x + 96 = 180$
 $7x = 84$
 $x = 12$