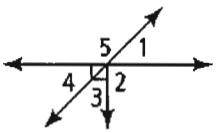
Name_____ Date_____

1.4 & 1.5 – Angle Pairs and Classifying Polygons

Use the diagram below for #1–3. Find the measure of each angle.

Use the diagram at the right. Is each statement true? Explain.



1. $\angle 2$ and $\angle 5$ are adjacent angles.

   False, the angles are not next to each other

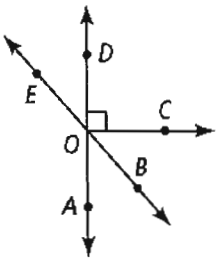
2. $\angle 1$ and $\angle 4$ are vertical angles.

   True, they are on opp. sides of vertex when two lines intersect

3. $\angle 4$ and $\angle 5$ are complementary.

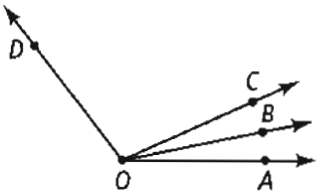
   False, their sum is 180°

Name an angle or angles in the diagram described by each of the following.



4. complementary to $\angle BOC$ ∠BOA
5. supplementary to $\angle DOB$ ∠BOA and ∠DOE
6. adjacent and supplementary to $\angle AOC$ ∠DOC

Use the diagram below for #7 and 8. Solve for x.
Find the angle measures.



7. $m\angle AOB = 4x - 1$; $m\angle BOC = 2x + 15$; $m\angle AOC = 8x + 8$

$(4x-1) + (2x+15) = 8x+8$

$6x+14 = 8x+8$

$6 = 2x$

$3 = x$

$m\angle AOB = 11°$
$m\angle BOC = 21°$
$m\angle AOC = 32°$

8. $m\angle COD = 8x + 13$; $m\angle BOC = 3x - 10$; $m\angle BOD = 12x - 6$

$(8x+13) + (3x-10) = 12x-6$

$11x+3 = 12x-6$

$9 = x$

$m\angle COD = 85°$
$m\angle BOC = 17°$
$m\angle BOD = 102°$

9. $\angle ABC$ and $\angle EBF$ are a pair of vertical angles; $m\angle ABC = 3x + 8$ and $m\angle EBF = 2x + 48$. What are $m\angle ABC$ and $m\angle EBF$?

$3x+8 = 2x+48$

$x = 40$

$m\angle ABC = 128°$

$m\angle EBF = 128°$

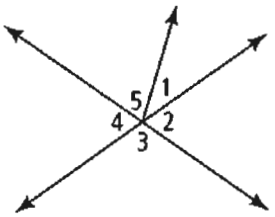
For #10-13, can you make each conclusion from the information in the diagram?

10. $\angle 3 \cong \angle 4$ No

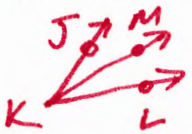
11. $\angle 2 \cong \angle 4$ Yes

12. $m\angle 1 + m\angle 5 = m\angle 3$ Yes

13. $m\angle 3 = 90$ No



14. $\overline{KM}$ bisects $\angle JKL$. If $m\angle JKM = 86$, what is $m\angle JKL$?

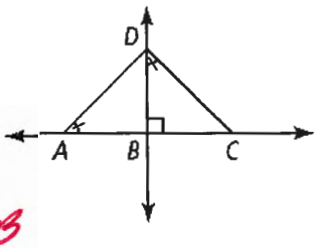


For #15–18, can you make each conclusion from the information in the diagram below?

15. $\angle DAB$ and $\angle CDB$ are congruent. Yes.

16. $\angle ADB$ and $\angle CDB$ are complementary. Yes

17. $\angle ADB$ and $\angle CDB$ are congruent. No.



$\angle DAB$ is comp. to $\angle ADB$

$\angle DAB \cong \angle CDB$

$\therefore \angle CDB$ is comp. to $\angle ADB$

18. $\angle ADB$ and $\angle BCD$ are congruent. Yes. (similar to #16)

19. $\angle MLN$ and $\angle JLK$ are complementary, $m\angle MLN = 7x - 1$, and $m\angle JLK = 4x + 3$.

a. Solve for x.

$(7x-1)+(4x+3) = 90$

$11x+2 = 90$

$11x = 88$

$x = 8$

b. Find $m\angle MLN$ and $m\angle JKL$.

$m\angle MLN = 55°$, $m\angle JKL = 35°$

c. Show how you can check your answer.

$55 + 35 = 90$

20. Describe all the situations in which the following statements are true.

a. Two vertical angles are also complementary.

When they are 45°

b. A linear pair is also supplementary.

All situations

State if the following are true or false. If false, sketch a counterexample.

21. For every line there is exactly one midpoint.

False

22. For every angle, there is exactly one angle bisector.

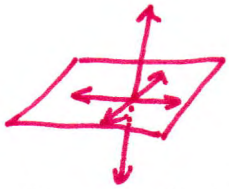
True

23. If two different lines intersect, then they intersect at one and only one point.

True

24. There is one and only one line perpendicular to a given line through a given point on the given line.

False



25. In a plane, there is exactly one line perpendicular to a given line through a given point on the given line.

True

26. There is exactly one line perpendicular to a given line through a given point not on the given line.

True

27. Through a given point not on a given line there is one and only one line that can be constructed parallel to the given line.

True