Mod 4 Test Review: Lines and Angles
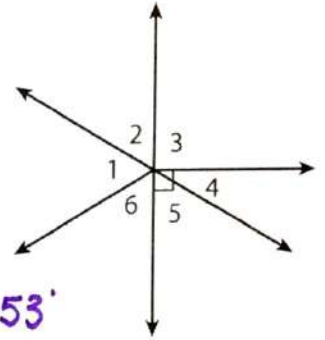
Name:_____

Date:_____ Per:_____

4.1

Use the figure for 1-3

1. The measure of $\angle 4$ is 38°. What is the measure of $\angle 2$?
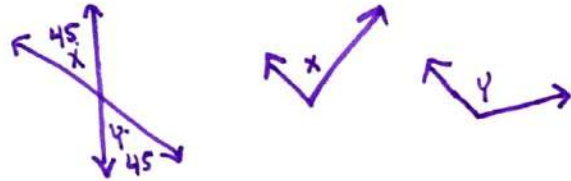
   52°

   $\angle 2 = \angle 5$
   $\angle 5 = 90° - 38°$

2. The measure of $\angle 1$ is 75° and the measure of $\angle 5$ is 52°. What is the measure of $\angle 6$?

   53°

   $\angle 1 + \angle 5 + \angle 6 = 180$ $\angle 6 = 53°$
   $75 + 52 + \angle 6 = 180$
   $127 + \angle 6 = 180$

3. $\angle X$ and $\angle Y$ do not share a side. The measure of $\angle X$ is 45° and the measure of $\angle Y$ is 45°. Which of the following terms could describe $\angle X$ and $\angle Y$. Choose True or False for each term.

   A linear   ○ True ● False
   B vertical   ● True ○ False
   C complementary   ● True ○ False
   D supplementary   ○ True ● False

For 5-6, use the figure below where $m \parallel n$

SSI $2y + 50 = 180$
     $2y = 130$
     $y = 65$

4. What is the value of y?
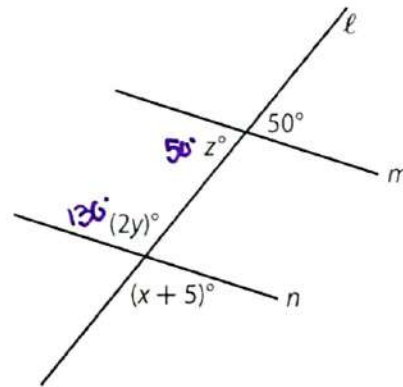
   65 *Not a degree*

   $x + 5 = 130$
   $x = 125$

5. What is the value of x?

   125 Not a degree
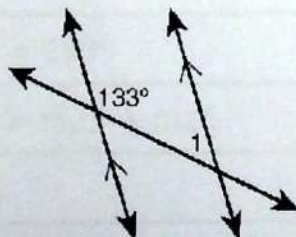
6. What is the value of z?

   50°

4.2

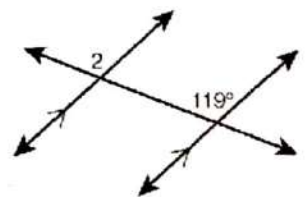**Find each angle measure.**

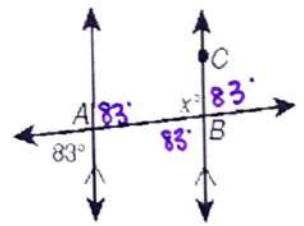7. $m\angle 1$ **147°**

SSI:
$180 - 133 =$

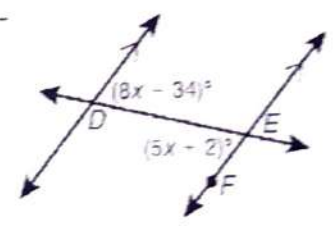8. $m\angle 2$ **119°**

CORR: $\cong$

9. m∠ABC __97°__

$180 - 83 = 97°$

10. m∠DEF __62°__

$8x - 34 = 5x + 2$

$3x - 34 = 2$

$3x = 36$

$x = 12$

$∠DEF = 5x + 2$

$= 5(12) + 2 = 62°$

11. The measure of $∠A = (x + 3)°$ and the measure of $∠B = (2x - 7)°$. If these angles are vertical, find the value of x and the measure of each angle. _____

Vertical: ≅

∠A = ∠B

$x + 3 = 2x - 7$
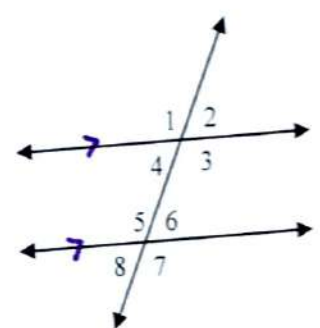
$3 = x - 7$

$10 = x$

∠A = x + 3

$= 10 + 3$

$= 13$

∠B = 2x - 7

$= 2(10) - 7$

$= 20 - 7$

$= 13$

$X = 10$

∠A = 13°

∠B = 13°

Prove the alternate interior Angles Theorem

12. Given: $p \parallel q$

**Prove:** m∠3 = m∠5

Same-Side Interior Angles Postulate
Linear Pair Theorem
Given
Definition of supplementary angles
Substitution Property of Equality
Subtraction Property of Equality

| Statements	Reasons
1. $p \parallel q$	a. Given
2. ∠3 and ∠6 are supplementary	b. SSI Angles Postulate
3. m∠3 + m∠6 = 180°	c. Def. of Supp. ∠'s
4. ∠5 and ∠6 are a linear pair	d. Given
5. ∠5 and ∠6 are supplementary	e. Def. of Linear Pair
6. m∠5 + m∠6 = 180°	f. Def of Supp. ∠'s
7. m∠3 + m∠6 = m∠5 + m∠6	g. Substitution Prop of Equ.
8. m∠3 = m∠5	h. Subtraction Prop of Equ.

13. Use a compass and straightedge to construct a line m through P parallel to a line l.
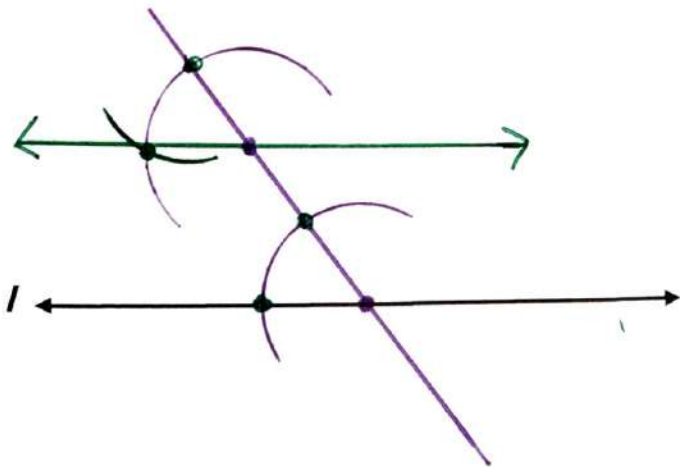
14. Use the given angle relationships to decide whether the lines are parallel. Explain your reasoning.

a. $\angle 2 \cong \angle 5$

b//c by the converse of SSI angles
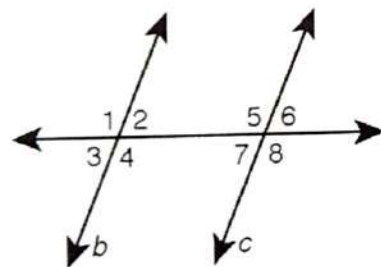
b. $m\angle 4 = (x + 20)°$, $m\angle 8 = (2x + 5)°$; and $x=15$

$M\angle 4 = x+20$ $\angle 8 = 2x+5$ Since $\angle 4 = \angle 8$ then b//c by the converse of corresponding angles

$= 15+20$ $= 2(15)+5$

$= 35$ $= 35$

c. $\angle 4 \cong \angle 8$
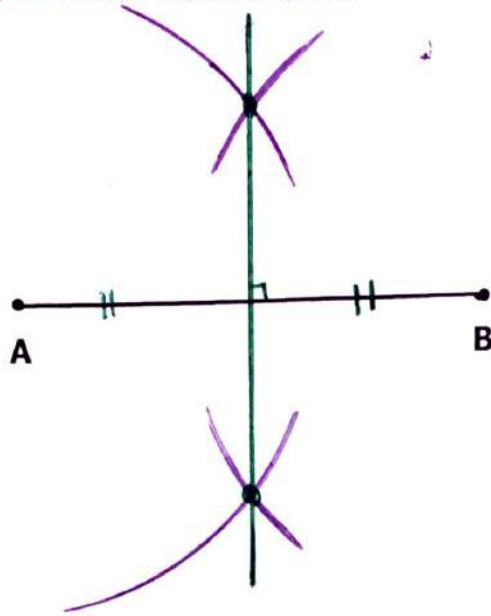
Since $\angle 4 \cong 8$ then b//c by converse of corresponding angles.

d. $m\angle 3 = 68°$, $m\angle 7 = (5x+3)°$, $x=13$

$\angle 7 = 5x+3$ Since $\angle 3 = \angle 7$ then b//c by the converse of corresponding angles

$= 5(13)+3$

$= 68$

4.4

15. Construct the perpendicular bisector of $\overline{AB}$

A   B

Use the figure to find the following lengths.

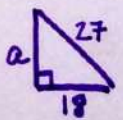16. Given: $\overrightarrow{WY}$ is the perpendicular bisector of $\overline{AB}$.

W   X   Y
27   18
B
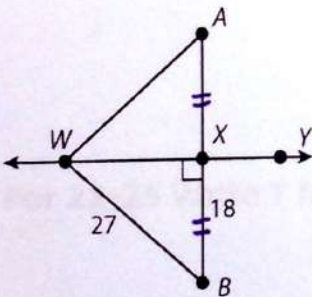
$WA =$ ___27___

$AX =$ ___18___

$AB =$ ___36___

$WX=$ ___$\sqrt{405}$ or $9\sqrt{5}$___

$a^2 + b^2 = c^2$
$a^2 + 18^2 = 27^2$
$a^2 + 324 = 729$
$a^2 = 405$
$a = \sqrt{405}$

$\sqrt{405}$
5 81
9 9
$= 9\sqrt{5}$

17. Given: $\overline{CE}$ is the perpendicular bisector of $\overline{FG}$.
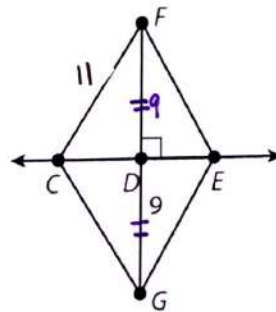
✱ Don't Know
, $\overline{DE}$, $\overline{FE}$, or $\overline{EG}$

F
=9
C   D   E
9
G

$FG =$ ___18___

$FD =$ ___9___

$CG =$ ___11___

$CD=$ ___$\sqrt{40}$ or $2\sqrt{10}$___
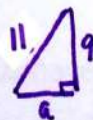
$a^2 + 9^2 = 11^2$
$a^2 + 81 = 121$
$a^2 = 40$
$a = \sqrt{40}$

$\sqrt{40}$
4   10
2 2

18. Write the equation of a line that is perpendicular to the line $y = 4x - 2$ and passes through the point (3, -1).

$y = 4x - 2$
$m = 4$

$\perp m = -\frac{1}{4}, (3,-1)$
$y - y_1 = m(x - x_1)$
$y - 1 = -\frac{1}{4}(x - 3)$
$y + 1 = -\frac{1}{4}x + \frac{3}{4}$
$\quad -1 \qquad\qquad -1$

$\boxed{y = -\frac{1}{4}x - \frac{1}{4}}$

$* \quad \frac{3}{4} - \frac{1}{1}$
$\frac{3}{4} - \frac{4}{4} = -\frac{1}{4}$

19. State whether each pair of lines is parallel, perpendicular, or neither.

a. $x - 2y = 12$ and $y = x + 5$

b. $\frac{1}{5}x + y = 8$ and $y = -5x$

a. $x - 2y = 12$
$-2y = -x + 12$
$y = \frac{1}{2}x - 6$

$y = x + 5$ $m = \frac{1}{2}$ $m = 1$
$\boxed{\text{Neither}}$

b. $\frac{1}{5}x + y = 8$
$y = -\frac{1}{5}x + 8$

$y = -5x$ $m = -\frac{1}{5}$ $m = -5$
$\boxed{\text{Neither}}$

20. Write the equation of a line that is parallel to $y = -3x + 1$ and passes through the point (9, 0)

$y = -3x + 1$
$m = -3$

$\perp m = \frac{1}{3}, (9,0)$
$y - y_1 = m(x - x_1)$
$y - 0 = \frac{1}{3}(x - 9)$
$\boxed{y = \frac{1}{3}x - 3}$

For 21-25 Write T for True or F for False. If false change the statement so that it is true.

21. __F__ Using examples is <u>not</u> an acceptable reason for proofs.
    $*$ Use definitions, postulates, + theorems

22. __F__ Alternate interior angles formed by parallel lines cut by a transversal are ~~supplementary.~~ congruent

23. __T__ Vertical angles are always congruent.

24. __T__ If a point is on a perpendicular bisector, then it is equidistant from the endpoints of a segment.

25. __F__ Lines that are perpendicular ~~both~~ have ~~a positive~~ slope.
    opposite reciprocal

26 – 33   Refer to the figure. Fill in the blank with the appropriate angle:

___∠6___ 26) ∠3 and ∠? are alternate interiors∠s

___∠1___ 27) ∠2 and ∠? are corresponding ∠s.

___∠5___ 28) ∠4 and ∠? are alternate exterior ∠s.

___∠5___ 29) ∠3 and ∠? are corresponding ∠s.

___∠6___ 30) ∠1 and ∠? are same side interior ∠s.

___∠2___ 31) ∠4 and ∠? are same side exterior ∠s.

___∠2___ 32) ∠8 and ∠? are vertical ∠s.

_∠3 or ∠4_ 33) ∠1 and ∠? are linear ∠s.
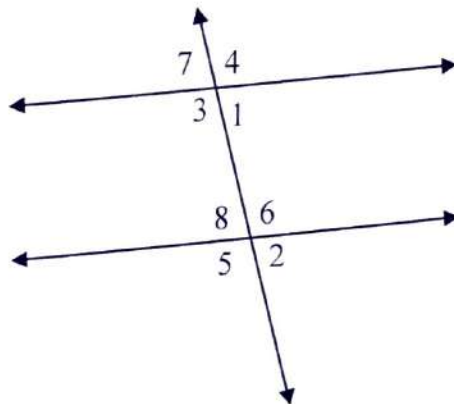
34. Answer the following using complete sentences and any information to defend/justify your thinking.

a. Can either of the lines referred to in the slope criterion for perpendicular lines be vertical? Why or why not?

b. If a linear pair of angles has equal measure, why are the angles right angles? Be specific.
Since linear pairs sum to 180 and if those 2 pairs are congruent than each angle must be 90°, therefore a right angle

c. How can you determine that a statement is the converse of a theorem? Give an example.

d. Near the end of an indirect proof, a step contradicts a known true statement. What does this mean in terms of the proof?