Parallel Lines Worksheet 1 Date: _____

I. Identifying Angles: Use the diagram below.

1. Given the figure, name a pair of alternate interior angles for

a. $\mathcal{L}_1$ and $\mathcal{L}_2$ ∠3 and ∠5, ∠4 and ∠6

b. $\mathcal{L}_2$ and $\mathcal{L}_3$ ∠7 and ∠9, ∠8 and ∠10

c. $\mathcal{L}_1$ and $\mathcal{L}_3$ ∠3 and ∠9, ∠4 and ∠10

2. Given the figure, name a pair of alternate exterior angles for

a. $\mathcal{L}_1$ and $\mathcal{L}_2$ ∠2 and ∠8, ∠1 and ∠7

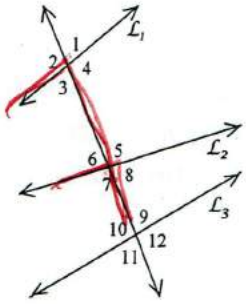
b. $\mathcal{L}_2$ and $\mathcal{L}_3$ ∠5 and ∠11, ∠6 and ∠12

c. $\mathcal{L}_1$ and $\mathcal{L}_3$ ∠1 and ∠11, ∠2 and ∠12

3. Name an angle that forms a corresponding angle pair with ∠7 using

a. $\mathcal{L}_1$ and $\mathcal{L}_2$ ∠3

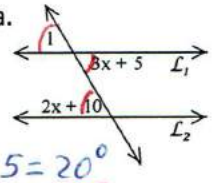
d. $\mathcal{L}_2$ and $\mathcal{L}_3$ ∠11




II. Solve.

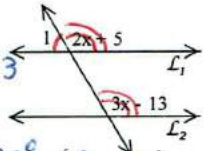
1. If $\mathcal{L}_1 \parallel \mathcal{L}_2$, find $m\angle 1$.

a.



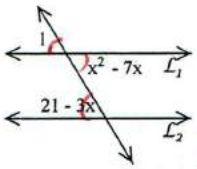

$3x+5=2x+10$
$x=5$
$m\angle 1 = 3\cdot 5+5 = 20^\circ$

b.



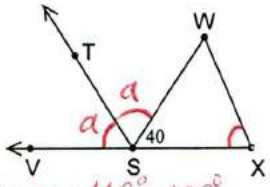

$2x+5=3x-13$
$x=18$
$m\angle 1 = 180^\circ - (2x+5)$
$m\angle 1 = 180^\circ - (2\cdot 18+5) = 139^\circ$

c.




$x^2-7x = 21-3x$
$x^2-4x-21=0$
$(x-7)(x+3)=0$
$x=7$ $x^2-7x=0$ D.N.S.
$x=-3$
$m\angle 1 = x^2-7x = 30^\circ$

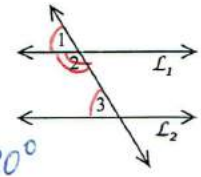
2. $\overline{ST} \parallel \overline{XW}$
$\overrightarrow{ST}$ bisects $\angle VSW$
Find $m\angle X$.




$a+a+40^\circ = 180^\circ$
$2a = 140^\circ$
$a = 70^\circ$
$m\angle X = 70^\circ$

4. Given: $\mathcal{L}_1 \parallel \mathcal{L}_2$
$m\angle 1 = x + 3y$
$m\angle 2 = 2x + 30$
$m\angle 3 = 5y + 20$

Find $m\angle 1$.

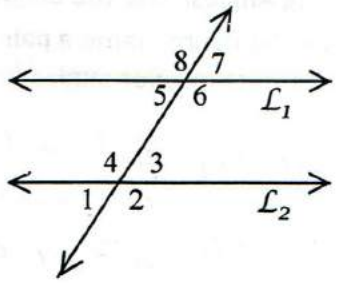



$x+3y = 5y+20$
$x = 20+2y$
$x+3y+2x+30 = 180^\circ$
$3x = 150-3y$
$x = 50-y$
$20+2y = 50-y$
$3y = 30$ $y=10$
$x = 20+2\cdot 10 = 40$

$m\angle 1 = x+3y$
$m\angle 1 = 40+3\cdot 10$
$m\angle 1 = 70^\circ$

**Parallel Lines Worksheet 2** **Date:** _____

**II. Given: $\mathcal{L}_1 \parallel \mathcal{L}_2$**




1. $m\angle 3 = 2x + 40$
   $m\angle 7 = 3x + 20$
   Find $m\angle 3$.

∠3 and ∠7 are corr. ∠s
$2x + 40 = 3x + 20$
$x = 20$
$m\angle 3 = 2 \cdot 20 + 40 = 80^\circ$

2. $m\angle 4 = 3x + 40$
   $m\angle 7 = 2x$
   Find $m\angle 1$.

∠1 and ∠7 are alt. ext. ∠s
$m\angle 1 + m\angle 4 = 180^\circ$
$2x + 3x + 40 = 180^\circ$
$5x = 140^\circ$
$x = 28$
$m\angle 1 = 2 \cdot 28 = 56^\circ$

3. $m\angle 5 = x^2$
   $m\angle 3 = 4x + 21$
   Find $m\angle 7$.

4

∠7 and ∠5 are vert. ∠s
∠3 and ∠5 are alt. int. ∠s

$m\angle 3 = m\angle 5$
$4x + 21 = x^2$
$x^2 - 4x - 21 = 0$
$(x - 7)(x + 3) = 0$
$x = 7$
$m\angle 5 = 7^2 = 49^\circ$
or
$x = -3$
$m\angle 5 = 9^\circ$

4. $m\angle 5 = 4x - 10$
   $m\angle 4 = 2x - 20$
   Find $m\angle 6$ and $m\angle 8$.

∠4 and ∠6 are alt. int. ∠s
∠6 and ∠8 are vert. ∠s

$m\angle 4 + m\angle 5 = 180^\circ$
$2x - 20 + 4x - 10 = 180^\circ$
$6x = 210$
$x = 35$
$m\angle 6 = m\angle 8 = 2 \cdot 35 - 20 =$
$= 50^\circ$

5. $m\angle 3 = 2y$
   $m\angle 4 = x + y$
   $m\angle 5 = 2x - y$
   Find $m\angle 3, m\angle 4$, and $m\angle 5$

∠3 and ∠5 are alt. int ∠s
$m\angle 3 = m\angle 5$
$2y = 2x - y$ $\quad 3y = 2x$

$m\angle 3 + m\angle 4 = 180^\circ$
$2y + x + y = 180^\circ$
$3y = 180^\circ - x$

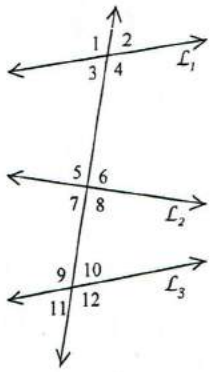
$2x = 180^\circ - x$
$3x = 180^\circ$
$x = 60^\circ$

$y = \frac{2}{3}x$
$y = 40^\circ$

$m\angle 3 = 2 \cdot 40^\circ = 80^\circ$
$m\angle 5 = 80^\circ$
$m\angle 4 = 180^\circ - 80^\circ = 100^\circ$

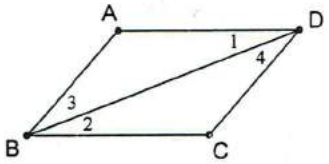
**Parallel Lines Worksheet 3** **Date:** _____

**I. Given the plane figure at the right, name:**




1. Two pairs of corresponding angles for $\mathcal{L}_2$ and $\mathcal{L}_3$
   ∠5 and ∠9
   ∠8 and ∠12
2. Two pairs of corresponding angles for $\mathcal{L}_1$ and $\mathcal{L}_3$
   ∠1 and ∠9
   ∠3 and ∠11
3. Two pairs of alternate interior angles for $\mathcal{L}_1$ and $\mathcal{L}_2$
   ∠3 and ∠6
   ∠4 and ∠5
4. Two pairs of alternate exterior angles for $\mathcal{L}_2$ and $\mathcal{L}_3$
   ∠5 and ∠12
   ∠6 and ∠11

**II. Use Quadrilateral ABCD.**




1. Name the 2 lines that determine and transversal that create:

   a. ∠3 and ∠4 as alternate interior angles

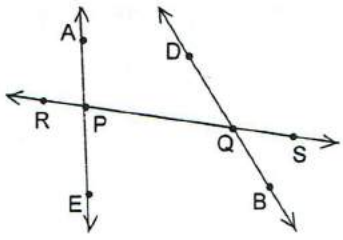
   AB & CD with transversal BD

   b. ∠1 and ∠2 as alternate interior angles

   BC & AD with transversal BD

2. Are there any corresponding angles that can be identified by the points and segments illustrated in the diagram?

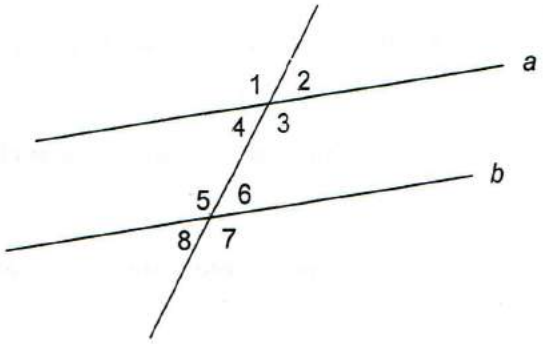
**III. Complete the following sentences.**




1. ∠$APQ$ and ∠$PQB$ are a pair of alt. int. angles.
2. ∠$EPQ$ and ∠PQD are a pair of alternate interior angles.
3. ∠$RPE$ and ∠$PQB$ are a pair of corr. angles.
4. ∠$RPA$ and ∠PQD are a pair of corresponding angles.
5. There are 4 pairs of corresponding angles in the diagram.
6. There are 2 pairs of alternate interior angles in the diagram.

# Parallel Lines and Special Angle Pairs

**I. Given: a||b.**




1. m∠2 = 60, m∠6 = 60°
2. m∠4 = 75, m∠6 = 75°
3. m∠5 = 100, m∠3 = 100°
4. m∠8 = 50, m∠7= 130°
5. m∠4 = 50, m∠3 = 130°
6. m∠3 = 60, m∠6 = 120°
7. m∠1 = 125, m∠7 = 125°
8. m∠2 = 72, m∠5 = 108°
9. m∠3 = 2x + 10, m∠8 = 5x –40, x = 30°

   $2x+10+5x-40=180$

   $7x=210$

   $x=30$
10. m∠2 = 2x + 10, m∠8 = 3x – 35, x = 45°

    $2x+10=3x-35$

    $x=45$

**II. True or False?**

1. Corr. ∠s are ≅.
2. ∠4, ∠16 are corr. ∠s.
3. ∠3 ≅ ∠7
4. ∠1 ≅ ∠15
5. ∠6 ≅ ∠8
6. ∠15, ∠16 supp.
7. ∠4 ≅ ∠9
8. ∠4 ≅ ∠14
9. ∠14 ≅ ∠12

**Given: a || b**