Name:________________________________

Geometry: Unit 6 – Parallel Lines

Set	Date	Topics	Assignment	Done
PL- Day 1		Proving Lines Parallel	334/ 3-8, 11, 13	
PL - Day 2		Properties of Parallel Lines	340/3-11(o),15,20	
PL - Day 3		Parallel Lines in the Coordinate Plane	345/ 3-13	
PL - Day 4		Sum of the measures of the Angles of a Triangle **QUIZ**	351/ 4,8,12,16,22,23, 28,29	
PL - Day 5		Angle, Angle, Side (A.A.S.)	356/3-8,12,13	
PL - Day 6		Converse of Isos. Triangle Thrm Construction of Incenter and Circumcenter	361/7,9,10,13,16	
PL - Day 7		Hypotenuse, Leg (H.L.) Construction of Orthocenter and Centroid	366/12,16	
PL - Day 8		Polygons **QUIZ**	371/ (3,4,5,6,8,10,12,15,16,17) a,b	
PL - Day 9		Review	375/ 1-25(o)	
PL -Day 10		Review	Study	
PL -Day 11		Test	377/1-10,16	

Answers to selected questions

PL- Day 1

3. If two coplanar lines are cut by a transversal so that the alternate interior angles formed are congruent, then the two lines are parallel.
4. If two coplanar lines are cut by a transversal so that the corresponding angles are congruent, then the two lines are parallel.
5. If two coplanar lines are cut by a transversal so that the interior angles on the same side of the transversal are supplementary, then the lines are parallel.
6. Vertical angles ($\angle 2$ and $\angle 4$) are congruent. If two coplanar lines are cut by a transversal so that the interior angles on the same side of the transversal are supplementary, then the lines are parallel.
7. Vertical angles ($\angle 2$ and $\angle 4$) are congruent. If two coplanar lines are cut by a transversal so that the corresponding angles are congruent, then the lines are parallel.
8. Vertical angles ($\angle 7$ and $\angle 5$) are congruent. If two coplanar lines are cut by a transversal so that the interior angles on the same side of the transversal are supplementary, then the lines are parallel.

11. $m\angle A + m\angle B = 3x + (180 - 3x) = 180$. Since interior angles on the same side of the transversal $\overline{AB}$ are supplementary, $\overline{AD} \parallel \overline{BC}$.

PL – Day 2

3. 80	4. 150	5. 120
6. 75	7. 115	8. 50
9. 42	10. 80	11. 65
12. 60	13. 44 and 136	14. 21 and 21

15. a. $m\angle 1 = 70, m\angle 2 = 110, m\angle 3 = 70, m\angle 4 = 50, m\angle 5 = 130, m\angle 6 = 50, m\angle 7 = 50, m\angle 8 = 60, m\angle 9 = 70$
    b. 120 c. Yes d. 120
    e. 110 f. 130 g. 180

16. $m\angle A = m\angle C = 75; m\angle ABC = m\angle D = 105$

PL - Day 3

3. Perpendicular 4. Parallel 5. Parallel
6. Neither parallel nor perpendicular
7. Parallel 8. Perpendicular
9. $y = -3x + 4$ 10. $y = \frac{1}{3}x + 4$
11. $y = \frac{1}{2}x + 3$ 12. $y = -3$

Applying Skills

13. a. $-\frac{1}{2}$ b. $-\frac{1}{2}$ c. $y = -\frac{1}{2}x + 6$
    d. 3 e. 3 f. $y = 3x - 1$
    g. (2, 5)

PL – Day 4

3. Yes	4. No	5. No
6. Yes	7. 40	8. 50
9. 54	10. 50	11. 80
12. 45	13. 52	14. 35
15. 20	16. 140	17. 90
18. 54	19. 120	

20. $m\angle ACD = 60; m\angle ACB = 120$
21. $m\angle ACD = 90; m\angle ACB = 90$
22. $m\angle ACD = 60; m\angle B = 20$
23. $m\angle B = 95; m\angle ACD = 135; m\angle ACB = 45$

Applying Skills

24. 46°, 67°, 67° 25. 70°, 55°, 55° 26. 20°, 80°, 80°
27. $m\angle N = 58$; measure of exterior angle = 122
28. a. $m\angle A = 72; m\angle B = 67; m\angle C = 41$ b. $\overline{BC}$
29. $m\angle A = m\angle C = 30; m\angle B = 120$; measure of exterior angle = 60

PL – Day 5

3. Yes, by AAS. 4. Yes, by AAS.
5. No. AAA is insufficient to prove congruence.
6. Yes, by AAS.
7. No. SSA is insufficient to prove congruence.
8. Yes, by SAS.

Applying Skills

9. Let $\triangle ABC \cong \triangle DEF$, so $\angle A \cong \angle D$ and $\overline{AC} \cong \overline{DF}$. Draw $\overline{CG}$, the altitude from $\angle A$ in $\triangle ABC$, and $\overline{FH}$, the altitude from $\angle F$ in $\triangle DEF$, to form right triangles $\triangle ABG$ and $\triangle DFH$. Two right triangles are congruent if the hypotenuse and an acute angle of one right triangle are congruent to the hypotenuse and an acute angle of the other right triangle, so $\triangle ACG \cong \triangle DFH$. Corresponding parts of congruent triangles are congruent, so the altitudes, $\overline{CG}$ and $\overline{FH}$, are congruent.

PL – Day 6

7. $x = 4$ **8.** $PR = RQ = 21$

9. $m\angle R = 72; m\angle N = 36$

10. $AB = AC = 36; BC = 46$

PL – Day 7

Proofs

PL – Day 8

3. a. 180 **b.** 900 **c.** 1,260

4. a. 360 **b.** 1,080 **c.** 540 **d.** 1,440

5. a. 360 **b.** 360 **c.** 360 **d.** 360

6. a. 90 **b.** 90

7. a. 72 **b.** 108

8. a. 60 **b.** 120

9. a. 45 **b.** 135

10. a. 40 **b.** 140

11. a. 30 **b.** 150

12. a. 18 **b.** 162

13. a. 10 **b.** 170

14. a. $8\frac{4}{7}$ **b.** $171\frac{3}{7}$

15. a. 12 **b.** 8 **c.** 6 **d.** 3

16. a. 4 **b.** 6 **c.** 9 **d.** 18

17. a. 3 **b.** 4 **c.** 5 **d.** 7 **e.** 10 **f.** 17 **g.** 12 **h.** 22

PL – Day 9 Review

1. 15 **2.** 30 **3.** 24 **4.** 55

5. a. 18 **b.** 72 **c.** 72 **d.** 108 **e.** 72

6. 30 **7.** 6 **8.** 36

9. 42, 48, 90 **10.** 120 **11.** 80

12. 40 **13.** 154 **14.** 60

15. 28 **16.** 20, 80, 80 **17.** 90

18. 30 **19.** 12 **20.** 1,260

21. In $\triangle ABC$, $\angle C$ is a right angle so $m\angle C = 90$. Therefore, $m\angle B < 90$ since $\angle B$ are complementary so $\angle B$ must be acute. If the measures of two angles of a triangle are unequal, the lengths of the sides opposite these angles are unequal and the longer side lies opposite the larger angle. Therefore, $AB > AC$.

22. Since $\overline{AEB}$ and $\overline{CED}$ bisect each other, $\overline{AE} \cong \overline{EB}$ and $\overline{CE} \cong \overline{ED}$. Vertical angles are congruent, so $\angle AEC \cong \angle BED$. Therefore, $\angle AEC \cong \angle BED$ by SAS. Corresponding parts of congruent triangles are congruent, so $\angle EAC \cong \angle EBD$. If two coplanar lines are cut by a transversal so that the alternate interior angles formed are congruent, then the two lines are parallel. Therefore, $\overline{AC} \parallel \overline{BD}$.

23. In $\triangle BPA$, $\overline{BP} \cong \overline{CP}$, so by the isosceles triangle theorem $\angle PBC \cong \angle PCB$. $\angle PBA$ and $\angle PBC$ form a linear pair, so they are supplementary. Also, $\angle PCD$ and $\angle PCB$ form a linear pair, so they are supplementary. If two angles are congruent, then their supplements are congruent, so $\angle PBA \cong \angle PCD$. It is given that $\angle APB \cong \angle DPC$, so $\triangle ABP \cong \triangle DCP$ by ASA. Corresponding parts of congruent triangles are congruent, so $\overline{PA} \cong \overline{PD}$.

24. In $\triangle BPC$, $\angle PBC \cong \angle PCB$. If two angles of a triangle are congruent, then the sides opposite these angles are congruent, so $\overline{PB} \cong \overline{PC}$. It is given that $\angle PBC \cong \angle PCB$. $\angle PBA$ and $\angle PBC$ form a linear pair, so they are supplementary. Also, $\angle PCD$ and $\angle PCB$ form a linear pair, so they are supplementary. If two angles are congruent, then their supplements are congruent, so $\angle PBA \cong \angle PCD$. Since $\overline{AB} \cong \overline{DC}$, $\triangle ABP \cong \triangle DCP$ by SAS. Corresponding parts of congruent triangles are congruent, so $\overline{PA} \cong \overline{PD}$.

25. No. The sum of the measures of the interior angles of a pentagon is 540 degrees, and angles A, B, C, and D have measures which already sum to 540. Since $m\angle E \neq 0$, Herbie's pentagon is not possible.