**Answers to homework for Section 3.6 Geometry for Enjoyment and Challenge.**

1. 10+x+7+2x-3 = 32
   3x + 14 = 32
   3x=18; x= 6 EG = 10; EF = 9; GF = 13 since all sides have different lengths, this triangle is scalene.

2. a.) scalene b.) isosceles c.) equilateral
   d.) scalene e.) scalene f.) isosceles

3. a.) right b.) obtuse c.) right
   d.) acute e.) right f.) acute

6. An equilateral triangle has all equal sides. 15 = x+8 so x=7
   1/3y – 6 = 15 1/3y = 21 y = 63

7. Where is YOUR diagram?

| Statements | Reasons |
|---|---|
| 1. AD and CD are legs of triangle ACD | 1. given |
| 2. $\overline{BC} \cong \overline{ED}; \angle 2 \cong \angle 4\ \overline{AD} \cong \overline{CD}$ | 2. The legs of an isosceles triangle are congruent |
| 3. B is the midpoint of AC | 3. given |
| 4. $\overline{AB} \cong \overline{BC}$ | 4. a midpoint divides a segment into two congruent parts |
| 5. $\overline{BD} \cong \overline{BD}$ | 5. reflexive property of congruence |
| 6. ΔABD ≅ ΔCBD | 6. SSS steps 2, 4, 5 |
| 7. $\angle A \cong \angle C$ | 7. CPCTC – corresponding parts of congruent triangles are congruent |

8.

| | |
|---|---|
| 1. $\overline{BI} \cong \overline{RD}; \overline{RI} \cong \overline{BD}$ | 1. given |
| 2. $\overline{ID} \cong \overline{ID}$ | 2. Reflexive property of congruence |
| 3. ΔIRD ≅ ΔDBI | 3. SSS steps 1,2 |
| 4. $\angle 3 \cong \angle 1$ | 4. substitution and CPCTC |
| 5. $\angle 3$ *is complementary to* $\angle 2$ | 5. given |
| 6. $\angle 1$ *is complementary to* $\angle 2$ | 6. complements of congruent angles are congruent |
| 7. $m\angle 1 + m\ \angle 2 = 90$ | 7. complementary angles are two angles whose measures sum to 90° |
| 8. $m\angle 1 + m\ \angle 2 = m\angle RIB$ | 8. Angle Addition |
| 9. $\angle RIB$ is a right angle | 9. All right angles have a measure of 90° |
| 10. ΔRIB is a right triangle | 10. A right triangle contains one right angle. |

10. For a triangle to be isosceles all three sides must be equal.

$X+7=3x+5$

$2 = 2x$

$1 = x$

or

$3x+5 = 9- x$

$4x=4$

$x=1$

or

$9 - x = x+7$

$2 = 2x$

$1=x$

all combinations produce a value for x of 1. SR=8; RT = 8 and ST = 8 (substituting in 1 for x)
Therefore the triangle is both isosceles and equilateral.