Chapter 4 Practice Test Solutions

1. Use the Angle Sum Theorem to find x = 12; substitute 12 for x in each angle, find the angle measures, then classify the triangle – **acute**.
2. Linear pair → m∠2 = 102; Angle Sum Theorem →78 + 5x + 7 + 3x – 1 = 180, so x = 12.
3. Isosceles Triangle ( 2 angles are congruent) and Exterior Angle Theorem
   → 8x – 10 = 3x + 9 + 3x + 9 so x = 14.
4. Exterior Angle Theorem → 20x + 4 = 8x + 3 + 13x – 4 so x = 5.
5. QR = 2n – 2, RS = n + 6, QS = 3n – 10 (or whatever variable you choose to use in place of "n"); since it is an equilateral triangle, choose any 2 sides to set equal → n = 8 and each side measures 14 (Show them, to be sure they come out the same. That is how you can see if your value of x is good.)
6. Isosceles Triangle tells us that the 3rd angle is congruent to 4x + 2, so Angle Sum Theorem is 8x + 4x + 2 + 4x + 2 = 180 and x = 11. 8x = 88, 4x + 2 = 46 (base angles measure 46 degrees each and vertex angle measures 88 degrees)
7. Isosceles triangle → 5x + 9 = 3x + 11 (notation shows us that 2x + 24 IS NOT equal to either of these – be careful!) so x = 1. Check solution by substituting 1 in for x on the 2 sides that should be equal; are they?

8 through 13: do not solve for the angle measures in the order the lines are given, it is not possible. Rather, solve the angles in the order that makes sense. Use Angle Sum Theorem, vertical angles, linear pairs and supplementary angles. Be careful if you are going to try to use Exterior Angle Theorem, it's tricky.

8. m∠2 = 79
9. m∠3 = 65
10. m∠4 = 45
11. m∠5 = 74
12. m∠6 = 147
13. m∠7 = 36

This is the order I used to solve for the angles:

a. linear pair to find the angle next to ∠1 (104), so that blank ∠ measures 76.
b. Angle sum theorem to find 3rd angle in left-hand triangle (36 degrees)
c. Vertical angles - m∠7 = 36
d. Solve for ∠4 because 70 + m∠4 + 65 = 180 (straight line), so m∠4 = 45
e. Solve for ∠3 because now 45 + 70 + m∠3 = 180 (straight line), so m∠3 = 65.
f. Solve for ∠2 because now 36 + m∠2 + 65 = 180 (angle sum theorem), so m∠2 = 79.
g. Solve for 3rd angle that is linear pair with ∠6 using angle sum theorem: 65 + 82 + "g" = 180, so g = 33.
h. Solve for ∠6 because 33 + m∠6 = 180 (linear pair). m∠6 = 147
i. Solve for ∠ that forms linear pair with ∠ whose measure is 119 → 180 -119 = 61.
j. Solve for ∠5 (angle sum theorem) because now 45 + 61 + m∠5 = 180, so m∠5 = 74.
   All done!