Practice 6-4

1a. rhombus **1b.** 72; 54; 54; 72 **2a.** rectangle
2b. 72; 36; 18; 144 **3a.** rectangle **3b.** 37; 53; 106; 74
4a. rhombus **4b.** 59; 90; 90; 59 **5a.** rectangle
5b. 60; 30; 60; 30 **6a.** rhombus **6b.** 22; 68; 68; 90
7. Yes; the parallelogram is a rhombus. **8.** Possible; opposite angles are congruent in a parallelogram.
9. Impossible; if the diagonals are perpendicular, then the parallelogram should be a rhombus, but the sides are not of equal length. **10.** $x = 7; HJ = 7; IK = 7$
11. $x = 7; HJ = 26; IK = 26$ **12.** $x = 6;$ $HJ = 25; IK = 25$ **13.** $x = -3; HJ = 13; IK = 13$
14a. 90; 90; 29; 29 **14b.** 288 cm^2 **15a.** 70; 90; 70; 70
15b. 88 $in.^2$ **16a.** 38; 90; 90; 38 **16b.** 260 m^2
17. possible **18.** Impossible; because opposite angles are congruent and supplementary, for the figure to be a parallelogram they must measure 90, the figure therefore must be a rectangle.

∠'s listed are in numeric order.

Here are the answers. Below are some randomly selected problems that show all of the work/ steps/ theorems, aka, all the gory details

1. $m\angle 3 = 54°$ If △, then △

$m\angle 4 + 54 + 54 = 180$

$m\angle 4 + 108 = 180$

$-108 \quad -108$

$m\angle 4 = 72°$

$m\angle 1 = 72°$ Opposite ∠'s of □ ≅

$m\angle 2 = 54°$ if 2 ||, alternate interior ∠'s ≅

Rhombus

* Other theorems are possible

5. $m\angle 1 = 60°$ if 2 ||, alternate interior ∠'s ≅

$m\angle 2 = 30°$ if 2 ||, alternate interior ∠'s ≅

$m\angle 3 = 30°$ if △, then △

$m\angle 4 + 30 = 90$

$-30 \quad -30$

$m\angle 4 = 60°$

Rectangle

6. $m\angle 2 = 68°$ If △, then △

$m\angle 3 = 68°$ Each diagonal of a RH bisects 2 ∠'s

$m\angle 4 = 90°$ Diagonals of a RH ⊥

$m\angle 1 + 68 + 90 = 180$

$m\angle 1 + 158 = 180$

$-158 \quad -158$

$m\angle 1 = 22$

Rhombus