MTH 202 - Quiz 4
2 October 2015
Name: Solutions

No calculators or other electronic devices are allowed on this quiz. If you need more space to solve a problem, use the back of the paper.

1. (5 points) Consider the following statement:

All rhombuses are squares.

Write this as an "if... then" statement, and determine whether it is true. Then write the converse and determine whether the converse is true.

Statement: If something is a rhombus, then it is a square.
False.

Converse: If something is a square, then it is a rhombus.
True.

2. (5 points) A polygon has \( m \) sides. One of its interior angles is 60°, and every other interior angle is 140°. How many sides does the polygon have?

Look for multiples of 180.

Since the sum of interior angles is 180\((m - 2)\):

\[
60 \quad \text{no}
\]

\[
+140 = 340 \quad \text{no}
\]

\[
+140 = 480 \quad \text{no}
\]

\[
+140 = 620 \quad \text{no}
\]

\[
+140 = 760 \quad \text{no}
\]

\[
+140 = 900 \quad \text{Yes!}
\]

Algebraic solution:

\[
180(m - 2) = 60 + 140(m - 1)
\]

\[
180m - 360 = 140m - 140
\]

\[
40m = 220
\]

\[
m = 7
\]

7 sides
3. (5+5=10 points) For the following problems, justify every step. Note, in each picture, the pair of parallel lines.

(a) Find an equation for $x$ and solve it.

\[ 42 + x + x = 180 \]
\[ 2x = 138 \]
\[ x = 69 \]

(b) Find $a$. *Hint:* You may find it helpful to extend the vertical line until it's a transversal of some other lines.

\[ b + 35 + 40 = 180 \quad \text{sum of int.} \quad \text{cs} \]
\[ b = 55 \]
\[ a + b = 180 \quad \text{straight line} \]
\[ a = 125 \]