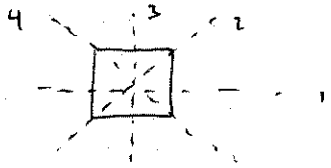
MTH 202 - Quiz 3

25 September 2015

Name: Solutions

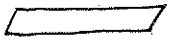
No calculators or other electronic devices are allowed on this quiz. If you need more space to solve a problem, use the back of the paper.

1. (2+2+2=6 points) (a) Draw a figure with exactly 4 lines of symmetry.



(b) Draw a figure with rotational symmetry of order 5.

(c) Draw a parallelogram which is not a rhombus.



Sides have unequal length.

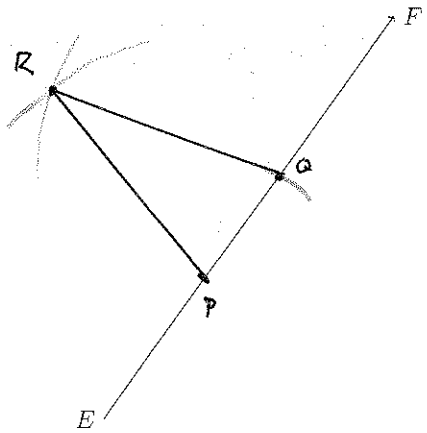
2. (10 points) You are given two segments ($\overline{AB}$ and $\overline{CD}$) and a ray ($\overrightarrow{EF}$). Use a compass and straightedge to draw an isosceles triangle so that:

(1) the base lies on the ray $\overrightarrow{EF}$,
(2) the base has length AB, and
(3) the other two sides have length CD.

Clearly indicate each step used in the construction.

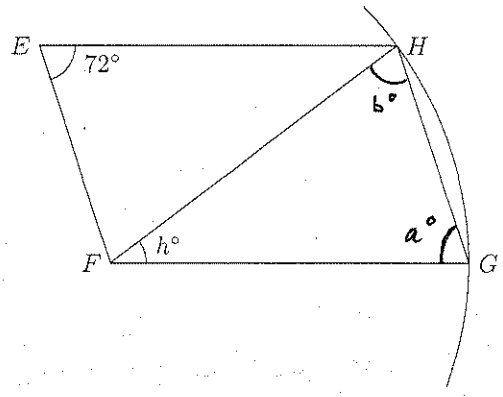
ΔPQR is the desired triangle.

1) Mark P on ray.
2) Circle, center P radius AB. Mark intersection Q.
3) Circles, center P and Q radii CD.
4) Mark intersection R.



3. (5+5=10 points) Give complete Teacher's Solutions to the following problems, justifying all steps and carefully organizing your solution.

(a) You are given that $EFGH$ is a parallelogram, and that G and H lie on a circle with center O (only part of the circle is shown). Find h.



$h = 36$

Mark angles as shown.

$a = 72$ opp. $\angle$s //-ogram

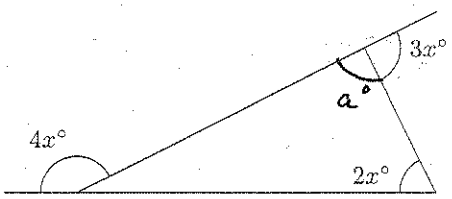
$FH = FG$ Defn of circle

ΔFGH is isosceles

$b = 72$ base $\angle$s of isos. Δ.

$72 + 72 + h = 180$ sum of $\angle$s in Δ

(b) Set up an equation for x, and solve it. Include a full Teacher's Solution: That is, justify each step in your work.



$x = 36$

$a = 180 - 3x$ $\angle$s on a line

$4x = 2x + (180 - 3x)$ ext. $\angle$ of Δ

$\therefore \quad 5x = 180$

$\therefore \quad x = \frac{180}{5}$