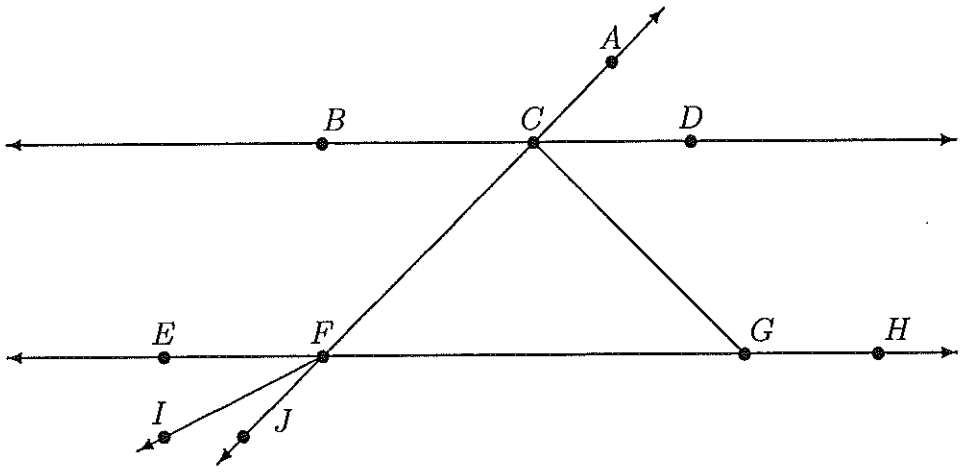
Key 14/14

Math 118 - Dr. Miller - Exam #2 - 11/05/09

1. *[14 pts - 2 each]* Refer to the diagram below (extra copies are on the back page):



(a) Name a set of three noncollinear points.

many correct answers (E, C, H is one.)

(b) Name three different objects that $\overline{FH}$ is part of.

$\overleftrightarrow{EH}$, $\overrightarrow{EH}$ or $\overrightarrow{HE}$ or $\overrightarrow{FH}$, EH, $\measuredangle AFG$ or $\measuredangle HFJ$, etc.

(c) Name a pair of adjacent angles that are not a linear pair.

$\measuredangle ACD + \measuredangle DCG$ is one option.

(d) Name a pair of acute vertical angles having F as a vertex.

$\measuredangle EFJ + \measuredangle AFH$

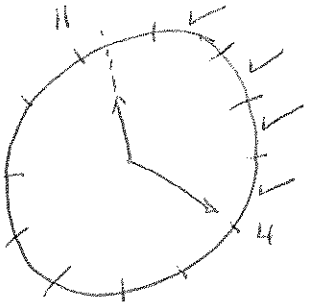
(*) ↓ (-1) bad answer

(e) Find $\overrightarrow{FE} \cup \overline{EG}$. $\overrightarrow{GE}$ or $\overrightarrow{GF}$

(f) Find $\overrightarrow{FC} \cap \angle DCA$. $\overrightarrow{CA}$

(g) Find $\angle GCF \cap \angle IFC$. $\overline{FC}$

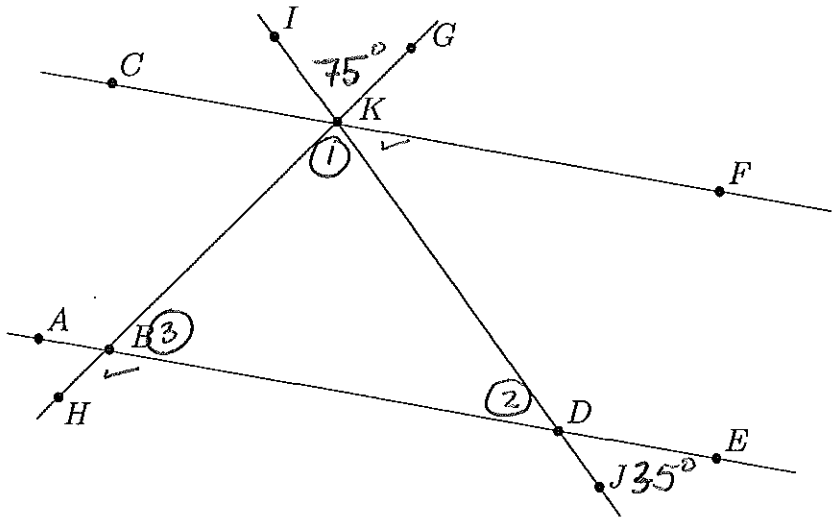
(2) $+\frac{1}{3}(30)$ 2. *[8 pts]* Find the exact size of the non-reflex angle formed by the hands of a working clock at 11:20. Show clear work.



4 entire 30° sectors + part of another.
$\frac{20}{60}$ gone, $\frac{40}{60}$ of 30° to go = 20°.

140°

3. *[10 pts]* In this diagram, $\overleftrightarrow{CF} \parallel \overleftrightarrow{AE}$, $m(\angle IKG) = 75°$, and $m(\angle JDE) = 35°$.



(a) Find $m(\angle JKF)$, clearly explaining your reasoning.

= 35° because it is a corresponding angle with ∠JDE.

(3)

(b) Find $m(\angle HBE)$, clearly explaining your reasoning.

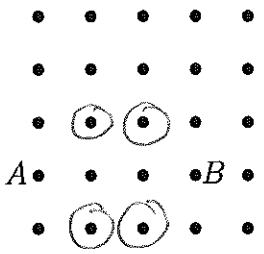
Inside the triangle, m(∠①) = 75° because it's vertical with ∠IKG.

(3) m(∠②) = 35° " " " " ∠JDE

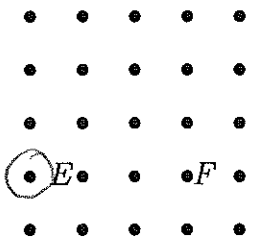
(2) m(∠③) = 70° because the interior angles of a △ total 180° in measure.

(2) m(∠HBE) = 110° because it's supplementary/a linear pair with ∠③.

4. (a) *[3 pts]* Circle all possible points C in the grid that would make $\angle BCA$ an obtuse angle.



(b) *[3 pts]* Circle all possible points D in the grid that would make $\angle DEF$ a straight angle.



(*)

5. *[8 pts]* Determine the total number of diagonals of a 140-gon, explaining your process thoroughly and clearly. (If you use a memorized formula, you must still explain why that formula works.)

(2) 9590
(3) n-3
(2) xn
(2) ÷ 2

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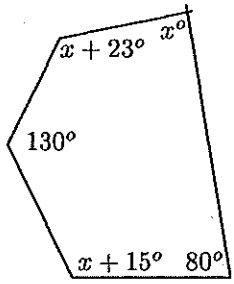
6. *[6 pts]* Is it possible for a polygon to have an interior angle total of $50,280°$? Justify your response with a suitable computation or verbal reasoning.

$$\frac{(n-2)\cdot 180^\circ}{180} = \frac{50280^\circ}{180}$$

$$n - 2 = 279.\overline{3}$$

n is the number of sides, so it must be a whole number. That's not so here, so 50280° is an impossible total.

7. *[6 pts]* Find the missing angle measures, rounded to the nearest tenth. Show work.



5 sides $\Rightarrow$ $(5-2)\cdot 180^\circ = 540^\circ$ total

$$x + (x+23) + 130 + (x+15) + 80 = 540$$

$$3x + 248 = 540$$
$$3x = 292$$
$$x = 97.3^\circ$$

The missing measures are 97.3°, 112.3°, and 120.3°.

8. *[8 pts - 2 each]* Classify each statement below as always, sometimes, or never true.

(a) A square is a quadrilateral.

always true

(b) An equilateral triangle is acute.

always true

(c) The diagonals of a rhombus are congruent.

sometimes true

(d) A trapezoid has no congruent sides.

sometimes true

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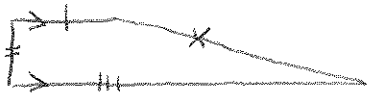
9. *[24 pts - 4 each]* Draw and mark examples as indicated of the following; if not possible, say so.

(a) a bisector of an angle (circle the actual bisector to mark it)

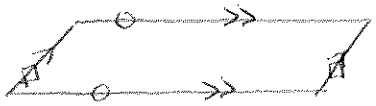
(b) a right equilateral triangle (mark the right angle; mark the sides to show same or different lengths)

not possible - the Δ needs only 60° angles so it can't have a 90° angle also

(c) a trapezoid having no congruent sides (mark the sides to show same or different lengths)

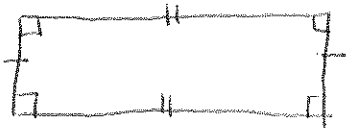


(d) a parallelogram that is not a square (mark the parallel sides with matching arrows; mark the sides to show same or different lengths)



(e) a curve that is closed but not simple (no marking required)

(f) a quadrilateral that is equiangular but not equilateral (mark all sides and angles to show same or different sizes)



10/10

10. *[10 pts - 2 each]* Complete each sentence with the correctly spelled term being defined.

(a) The point where the two rays creating an angle are joined together is called the ... VERTEX.

(b) A polygon having twelve sides is called a ... DODECAGON.

(c) Two angles whose measurements total 90^o are called ... COMPLEMENTARY.

(d) Three or more lines that intersect at the same point are called ... CONCURRENT.

(e) A polygon that is both equiangular and equilateral is called ... REGULAR.