

Test on Chapter 1 and Class Discussions (100 Points, No Calculator Allowed)

- Think about each problem, and do not guess unless absolutely necessary.
- Cross all your z's.
- Mathematics is about *communication* more than it is about calculating answers. (After all, computers can calculate answers faster and more accurately than any of us, but you don't see a computer teaching this class, do you?) Therefore, problems requiring work or explanation are scored with approximately one third of the points for the answer and the other two thirds for your work or explanation.
- If your explanations are hard to read, spotty, or cryptic, you may not earn full credit, even if your answers are correct.
- Complete sentences are not expected unless specifically required by the problem. Focus on being clear and concise. Ditto marks are perfectly acceptable.
- If you obtain an answer that you know is wrong, mark it with "NR" for Not Reasonable. More partial credit is available if you indicate that you know something is amiss. A small deduction will be made if you mark "NR" on a correct solution, however.
- If an answer involves messy arithmetic, you may leave it unsimplified unless the problem says that simplification is required. For example, if the answer to a problem is 15 times $3/7$, with the entire quantity raised to the 4th power, you may simply write $(15 \cdot 3/7)^4$.
- Carefully read the instructions for each part.

~~★~~ NO PARTIAL CREDIT IN PART I

Part I: Always, Sometimes, Never (4 pts. each)

In the small blank, write *A* if the given statement is always true, *S* if it is sometimes true, or *N* if it is never true.

A 1. An obtuse angle has a greater measure than an acute angle.

If measure > 90, then surely it exceeds something < 90.

A 2. If a conditional statement is false, then its contrapositive is also false.

Cond. \iff contrapositive (equivalent)

A 3. A definition is a biconditional statement.

A 4. In $\triangle RST$ having $RS = ST = 7$, \overline{RT} must be less than 14 units long.

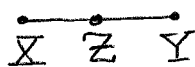
$$0 < RT < 7 + 7 = 14$$

N 5. If $\angle ABC$ is right, then A, B, and C are collinear.

N 6. $\overline{XY} \cap \overline{YZ} = \emptyset$.

Intersection is point Y only.

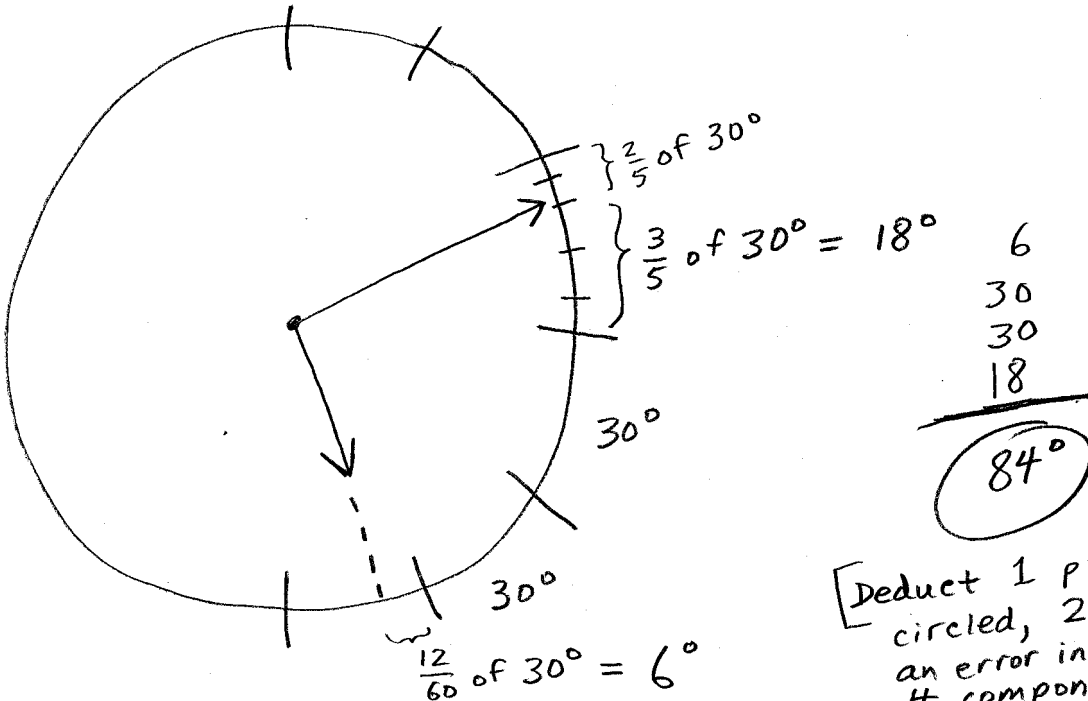
Intersection is \overline{YZ} .



(At a minimum, the intersection would include Y.)

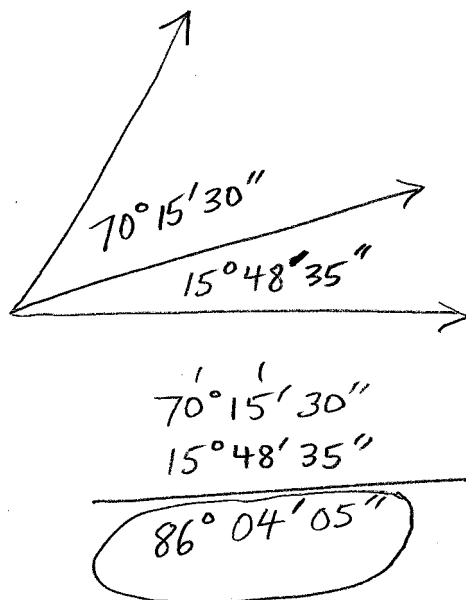
Part II: Free Response (12 pts. each)
SHOW YOUR WORK.

7. Compute the angle between the hour hand and the minute hand at 5:12 p.m.
 Explain your reasoning clearly. Complete sentences are not required, but clarity is. A marked-up diagram will serve as sufficient explanation if it is carefully drawn; otherwise, you will want to write some additional words of justification.



[Deduct 1 pt. if not circled, 2 pts. for an error in any of the 4 components (8 pts. max.), and 3 pts. if work is unclear.]

8. Sketch an angle of $70^\circ 15' 30''$ and another angle of $15^\circ 48' 35''$ in such a way that the two angles share a common side. What do you get if you add the two angles? Show your work.



4 pts. for sketch
 4 pts. for answer (-1 if not circled)
 4 pts. for showing "carries" or other work
 Deduct 1 pt. if not in format shown.

9. Given: If something is a fripster, then it is not googly.
If something is hooplahphonic, then it is googly.

Define letters F, G, and H as sentences. What can you conclude?

3 pts.
(deduct
1 if
not
written
as sentences)

Let F = "Something is a fripster."

Let G = "Something is googly."

Let H = "Something is hooplahphonic."

3 pts.
for any
work —
4 pts. if
 $G \Rightarrow \sim F$ is
shown

Work: $F \Rightarrow \sim G$ (thus $G \Rightarrow \sim F$ by contrapositive)
 $H \Rightarrow G$

Conclusion (OK to leave as symbols if you defined F, G, H as sentences above):

6 pts. (either
version ok)

$$H \Rightarrow \sim F$$

OR: If something is hooplahphonic, then it is not a fripster.

10. List all possible names for ΔABC . If we choose one of these at random, what is the probability that the name spells an English word?

[Deduct 1 pt.
if " Δ "
symbols are
missing.
List = 3 pts.
Answer (circled)
= 3 pts.]

ΔABC

ΔACB

ΔBAC

ΔBCA

ΔCAB

ΔCBA

$$P(\text{English}) = \left(\frac{1}{6}\right)$$

11. Given: $m\angle QVC = 5y^2$

$\angle QVC$ is a straight angle

Find: y

$$\begin{aligned} m\angle QVC &= 5y^2 = 180 \\ y^2 &= 36 \\ y &= \pm 6 \end{aligned}$$

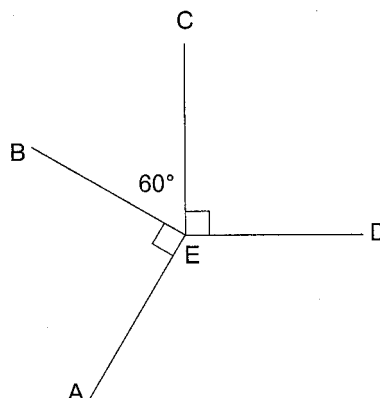
← 6 pts. for this
equation (or
something similar)

$$\{6, -6\}$$

← 3 points for
each of the two
possible solutions

Part III: Two-Column Proof (16 pts.)

12. Given: Diagram as marked
Prove: $\angle AEC \cong \angle BED$



1. Diagram as marked
2. $m\angle CED = m\angle AEB = 90$
3. $m\angle AEC = 150$
 $m\angle BED = 150$
4. $m\angle AEC = m\angle BED$
5. $\angle AEC \cong \angle BED$

1. G
2. Diagram
3. \angle addition
4. Trans. (in 3)
5. Def. \cong

6 pts. for final step (3 for statement, 3 for reason)
2 pts. for numbering all steps
1 pt. for Halmos sign or Q.E.D.
3 pts. for the given
4 pts. for something similar in spirit to step 3



BONUS (1 point): State Mr. Hansen's policy on gifts (max. of 5 words).

He does not accept gifts.

FEEDBACK BONUS (2 points):

Name something you enjoyed learning during our first two weeks together as a class.

Type I/Type II error rap

Name something about which you are still somewhat unclear or could use further help.

Venn diagrams