20 not equally-weighted questions for 50min

Math 1312 Test 1 Review Questions

Test 1 covers chapters 1 and 2 from the textbook.
How to study: Study the class notes, review homework problems, and try to do as many exercises as you can from the textbook. Note that answers are provided at the back of the book to all odd numbered problems.
You need to know what definitions mean and theorems and postulates as facts but you do not need to memorize them word by word.
Here I provide ***some*** examples for you. This is ***not*** a complete list, studying only these examples is not enough!

1. Conditional statement: C H
Two angles are complementary, *if* *the sum of their measures is* 90°.

Hypothesis:

Conclusion:

Rewrite the conditional in the standard "If hypothesis, then conclusion" form.

If the sum of the measures of 2 ∠s is 90°,
H→C then they are complementary.

Converse:

C→H If two ∠s are complementary,
then the sum of their measures is 90°.

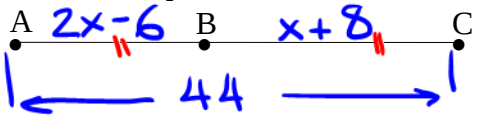
Inverse:

~H→~C If the sum of the measures of two
∠s is not 90°, then they are not complementary.

Contrapositive:

~C→~H If two ∠s are not complementary,
then the sum of their measures is not 90°.

2. Is B the midpoint of $\overline{AC}$ if $BC = x + 8$, $AB = 2x - 6$, and $AC = 44$?



YES!

$2x - 6 + x + 8 = 44$

$3x + 2 = 44$

$3x = 42$

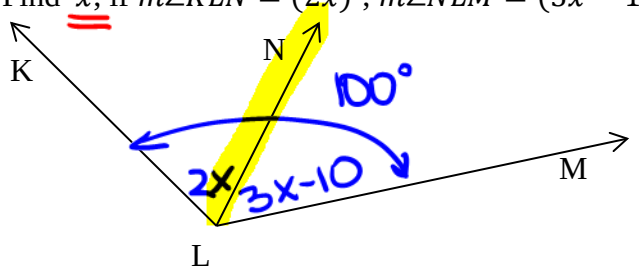
$x = 14$

$AB = 2(14) - 6$

$= 22$

$BC = 14 + 8 = 22$

3. Find x, if $m\angle KLN = (2x)^\circ$, $m\angle NLM = (3x - 10)^\circ$, and $m\angle KLM = 100^\circ$.



$2x + 3x - 10 = 100$

$5x - 10 = 100$

$5x = 110$

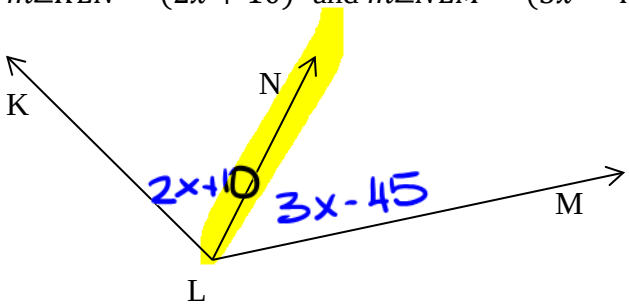
$x = 22$

$m\angle KLN = 2(22) = 44^\circ$

$m\angle NLM = 3(22) - 10 = 56^\circ$

$\overrightarrow{LN}$ is NOT an $\angle$ bisector.

4. Classify angle KLM if it is known that $\overrightarrow{LN}$ is an angle bisector and $m\angle KLN = (2x + 10)^\circ$ and $m\angle NLM = (3x - 45)^\circ$



$2x + 10 = 3x - 45$

$10 = x - 45$

$x = 55$

$m\angle KLN = 2(55) + 10$

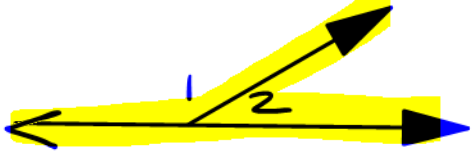
$= 120^\circ$

$m\angle KLM = 2(120) = 240^\circ$

reflex

supplementary

5. If angles 1 and 2 form a linear pair (i.e. $\angle 1$ and $\angle 2$ are adjacent and ~~complementary~~) and $m\angle 1 = (6x + 10)^\circ$ and $m\angle 2 = (2x + 10)^\circ$, find x, and the measures of both angles.



$6x+10+2x+10 = 180$

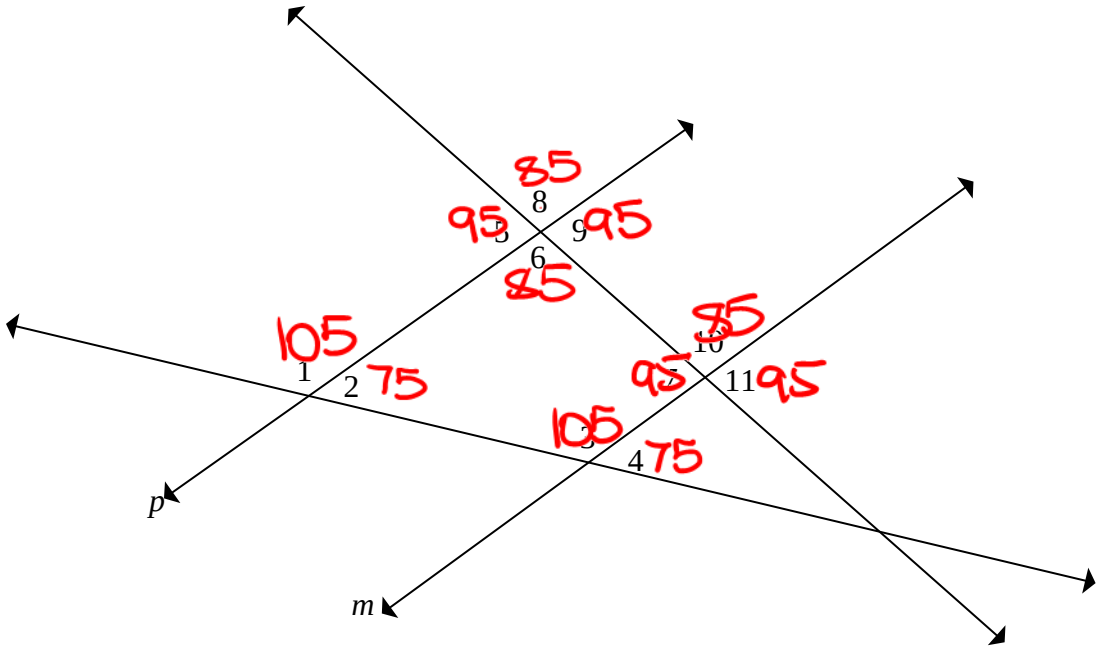
$8x+20 = 180$

$8x = 160$

$x = 20$

$m\angle 1 = 6(20)+10 = 130^\circ$ $\quad m\angle 2 = 2(20)+10 = 50^\circ$

6. If $p \parallel m$ and $m\angle 3 = 105^\circ$ and $m\angle 5 = 95^\circ$, find the measures of all other angles in the following figure.



7. Identify the type of Reasoning used in the following examples.

a. Michael received two Christmas gifts from his parents in the last three years. He believes he will receive two gifts for Christmas from his parents this year.

Inductive

b. All dogs are friendly. Molly has a very friendly pet named Rocky. Hence, Rocky is a dog.

1. If an animal is a dog, then it is friendly. (P → Q)
2. Rocky is friendly. (Q)
∴ Rocky is a dog. (P)

1. $P \to Q$
2. P
$\therefore Q$

1. $P \to Q$
2. $\sim Q$
$\therefore \sim P$

No Reasoning

8. Give an indirect proof of the following statement.

If two angles are not congruent, then these angles are not vertical angles.

Proof: Assume two ∠s are vertical.

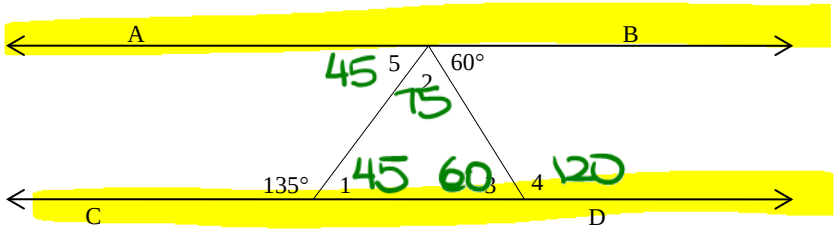
Then these ∠s are congruent.

BUT they are not congruent. Contradiction!

Hence the assumption is false.

Then the ∠s are not vertical. ∎

9. Find the measures of angles 1-5 in the figure below, if $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.



10. Find the measure of an interior and exterior angles of a regular hexagon. **Know the formulas!**

$n = 6$

$E = \frac{360}{6} = 60°$

$I = \frac{(n-2)\cdot 180}{n}$

$I = 180 - 60 = 120°$

$I = \frac{(6-2)\cdot 180}{6} = 120°$

11. Classify a triangle if it is known that the sum of the measures of two angles of the triangle is equal to the third (largest) angle and none of the side lengths are equal to each other.

Scalene

Right

$m\angle 1 + m\angle 2 = m\angle 3$

$m\angle 1 + m\angle 2 + m\angle 3 = 180$

$m\angle 3 + m\angle 3 = 180$

$m\angle 3 = 90°$

12. Given: $\overline{XY}$ intersect $\overline{ZW}$ at point M. $\overline{ZM} \cong \overline{MW}$ and $\overline{ZM} \perp \overline{MX}$.

Which of the following statements is true?

i. Point M is the midpoint of $\overline{ZW}$.

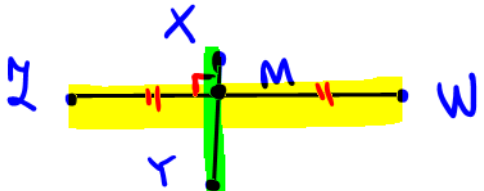
ii. Point M is the midpoint of $\overline{XY}$.

iii. $\overline{XY}$ is a bisector of $\overline{ZW}$.

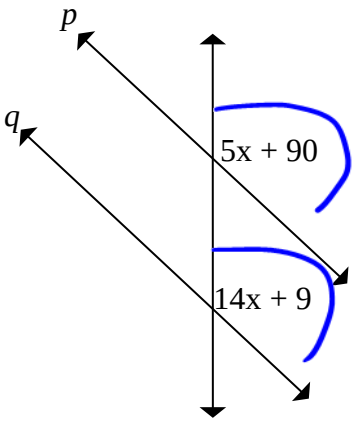
iv. $\overline{ZW}$ is a bisector of $\overline{XY}$.

v. $\overline{XY}$ is the perpendicular bisector of $\overline{ZW}$.

vi. $\overline{ZW}$ is the perpendicular bisector of $\overline{XY}$.



13. Find x that insures that $p \parallel q$.



$5x + 90 = 14x + 9$

$90 = 9x + 9$

$81 = 9x$

$x = 9$

14. Decide whether the following is always true, sometimes true, or never true.

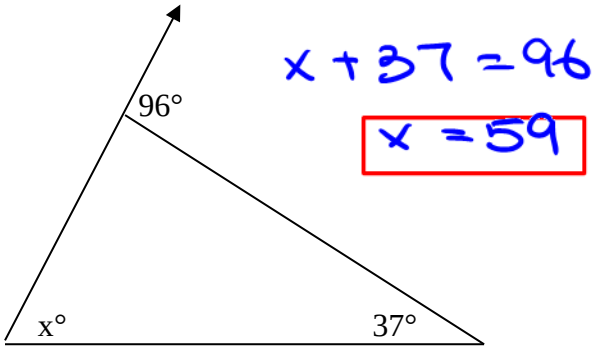
If ∠1 and ∠2 are complementary and ∠2 and ∠3 are complementary, then ∠1 and ∠3 are vertical.

$m\angle 1 + m\angle 2 = 90°$

$m\angle 2 + m\angle 3 = 90°$

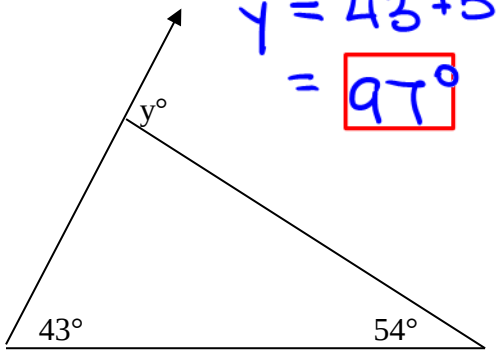
$m\angle 1 = m\angle 3$

15. Find the value of x and y in the following figures.



$x + 37 = 96$

$x = 59$



$y = 43 + 54$

$= 97°$

16. Complete the following proof.
Given: B is the midpoint of $\overline{AC}$.
Prove: $AB = \frac{AC}{2}$.

PROOF	
Statements	**Reasons**
1. B is the midpoint of $\overline{AC}$	**1.** Given
2. $AB = BC$	**2.** Def. of the midpoint
3. $AB + BC = AC$	**3.** Seg. Add. Postulate
4. $AB + AB = AC$	**4.** Substitution
5. $2(AB) = AC$	**5.** Substitution
6. $AB = \frac{AC}{2}$	**6.** Division Property of Equality