20 not equally-weighted questions for 50 min

**Math 1312 Test 2 Review Questions**

**Test 2 covers chapters 3 and 4 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.** It is given that $\Delta ABC \cong \Delta DEF$.

**a)** If $m\angle A = 37^o$ and $m\angle E = 68^o$, find $m\angle F$.

**b)** If $AB = 7.3cm$, $BC = 4.7cm$, and $AC = 6.3cm$, find $EF$.

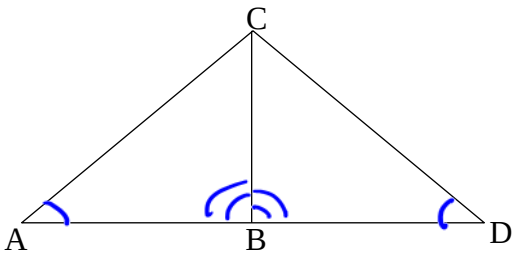
a) $m\angle F = 180 - 37 - 68 = 75^\circ$

b) $EF = BC = 4.7\,cm$

**2.**

**a)** Use ONLY the given information to state the reason why $\Delta ABC \cong \Delta DBC$.
$\angle A \cong \angle D$, $\angle ABC \cong \angle DBC$, and $\overline{BC} \cong \overline{BC}$ (Identity).

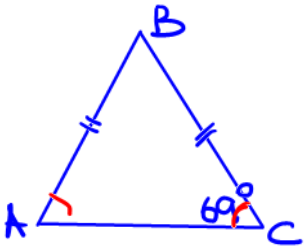
**b)** What additional parts needed to prove $\Delta ABC \cong \Delta DBC$ by ASA if we know that $\angle A \cong \angle D$ and $\angle ABC \cong \angle DBC$?




a) AAS

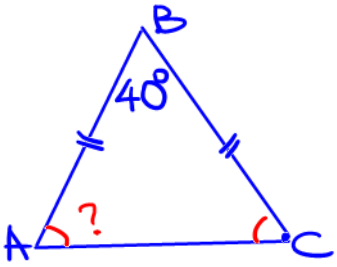
b) $\overline{AB} = \overline{DB}$

**3.** Given $\Delta ABC$ with $\overline{AB} \cong \overline{BC}$ and $m\angle C = 69^o$, find $m\angle A$. Draw a picture!



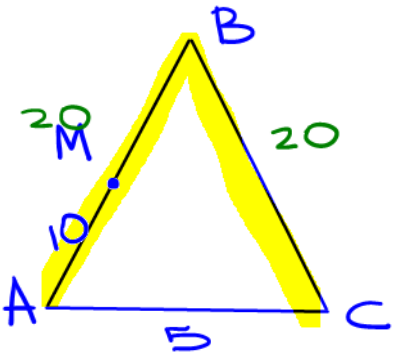

$m\angle A = m\angle C = \boxed{69^\circ}$

**4.** Given $\Delta ABC$ with $\overline{AB} \cong \overline{BC}$ and $m\angle B = 40^o$, find $m\angle A$. Draw a picture!




$m\angle A = \dfrac{180-40}{2} = \boxed{70^\circ}$

**5.** Given $\Delta ABC$ with $\overline{AB} \cong \overline{BC}$, and $M$ is the midpoint of $\overline{AB}$. Find the perimeter of $\Delta ABC$, if $AM = 10$ and $AC = 5$. Draw a picture!




$AB = 2(10) = 20$

$P(\Delta ABC) = 20 + 20 + 5 = \boxed{45}$

**6.** The measures of two sides of a triangle are 3 and 4. Between what two numbers must the measure of the third side fall?

$4-3 < x < 4+3$

$\boxed{1 < x < 7}$

**7.** Is it possible to draw a triangle those sides measure

a) 8, 9, 10?
b) 8, 9, 17?
c) 8, 9, 18?

a) $8+9 > 10$ YES

b) $8+9 \not> 17$ NO

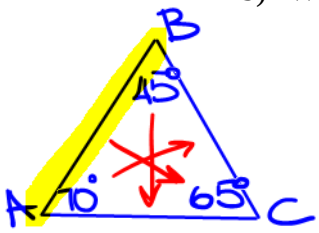
c) $8+9 \not> 18$ NO

9, 4, 7 $\quad 4+7>9$ YES

**8.** In $\Delta ABC$, $m\angle A = 70^o$ and $m\angle B = 45^o$.

a) Is it true that $\overline{AB}$ is the longest side of that triangle?

b) Write an extended inequality that compares the lengths of the sides of $\Delta ABC$.




a) $m\angle C = 180 - 70 - 45 = 65°$

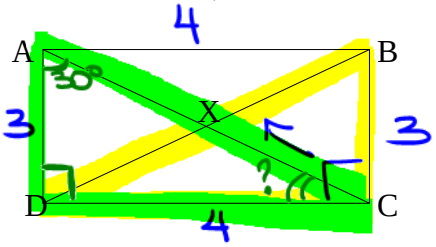
NO, AB is the middle side

b) $BC > AB > AC$

$AC < AB < BC$

**9.** $AD = 3$, $DC = 4$. Find the length of the diagonal $\overline{BD}$.

ABCD is a rectangle




$BD = \sqrt{4^2+3^2} = \sqrt{25} = 5$

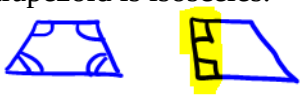
**10.** $m\angle DAX = 30^\circ$. Find the measure of angle $DCA$.

$m\angle DCA = 90 - 30 = 60°$

**11.** State whether each statement is Always True, Sometimes True, or Never True.

a) A square is a rectangle. AT

b) If two of the angles of a trapezoid are congruent, then the trapezoid is isosceles. ST



c) The diagonals of a trapezoid bisect each other. NT

d) The diagonals of a parallelogram are perpendicular. ST (square rhombus)

e) A rectangle is a square. ST

f) The diagonals of a square are perpendicular. AT (4.4)

g) Two consecutive angles of a parallelogram are supplementary. 180° AT

h) Opposite angles of a rhombus are congruent. rhombus is always a parall. AT

i) The diagonals of a rectangle are congruent. AT

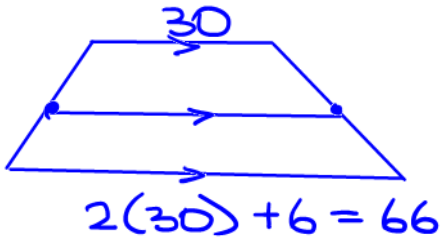
j) The four sides of a kite a congruent. NT

k) The diagonals of a parallelogram bisect each other. AT

**12.** Which of the following congruency principal(s) do NOT exist?

~~$AAA \cong$~~ $ASA \cong$ $AAS \cong$ $SSS \cong$ $SAS \cong$ ~~$SSA \cong$~~

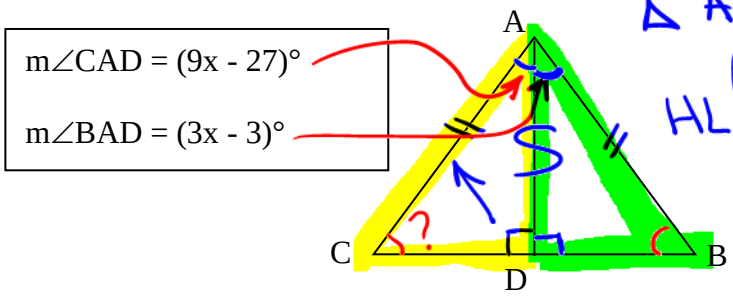
**13.** Find the length of the median of a trapezoid if its upper base is 30 and the length of the lower base is 6 more, than twice the length of the upper base.




$m = \frac{1}{2}(30+66) = \boxed{48}$

with $\overline{AC} \cong \overline{AB}$

**14.** In an isosceles triangle $ABC$, $\overline{AD}$ is an altitude. Find $m\angle C$.




$\triangle ADC \cong \triangle ADB$

HL $\begin{cases} \overline{AC} \cong \overline{AB} \\ \overline{AD} \cong \overline{AD} \text{ (Identity)} \end{cases}$

$\angle CAD \cong \angle BAD$ by CPCTC

$9x - 27 = 3x - 3$

$6x - 27 = -3$

$6x = 24$

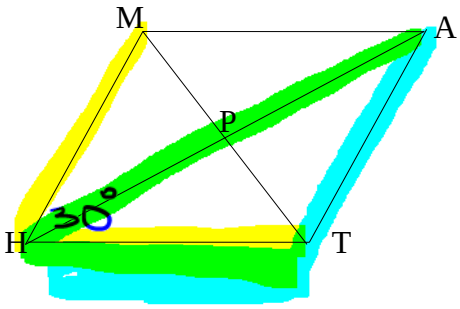
$x = 4$

$m\angle CAD = 9(4) - 27 = 9^\circ$

$m\angle CAB = 2(9) = 18^\circ$

$m\angle C = \frac{180 - 18}{2} = 81^\circ$

**15.** In a rhombus $MATH$ with diagonals $\overline{MT}$ and $\overline{AH}$, $m\angle MHT = 30^\circ$. Find $m\angle AHT$ and $m\angle ATH$.



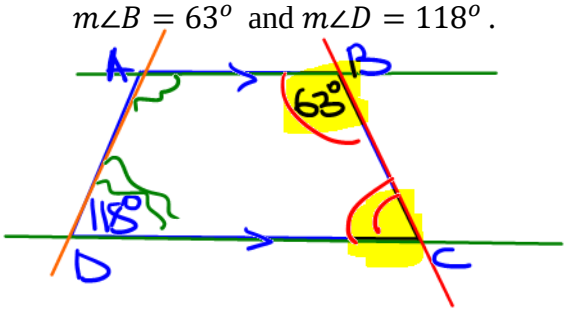

$m\angle AHT = \frac{1}{2}(m\angle MHT)$

$= \frac{1}{2}(30) = \boxed{15^\circ}$

$m\angle ATH = 180 - m\angle MHT$

$= 180 - 30 = \boxed{150^\circ}$

**16.** Find the measures of the remaining angles of trapezoid $ABCD$ with $\overline{AB}$ parallel to $\overline{DC}$, if $m\angle B = 63^o$ and $m\angle D = 118^o$.



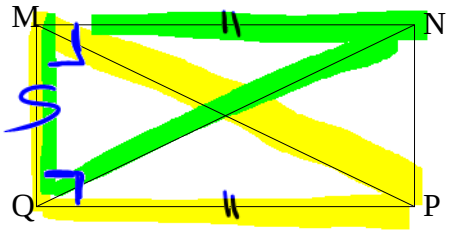

$m\angle C = 180 - 63 = 117°$

$m\angle A = 180 - 118 = 62°$

**17.** Complete the following proof:

Given: rectangle $MNPQ$ with diagonals $\overline{MP}$ and $\overline{NQ}$.

Prove: $\overline{MP} \cong \overline{NQ}$




| **PROOF** | |
|---|---|
| **Statements** | **Reasons** |
| **1.** $\square MNPQ$ with diagonals $\overline{MP}$ & $\overline{NQ}$ | **1.** Given |
| **2.** $MNPQ$ is a parallelogram | **2.** Def. of a rectangle. |
| **3.** $\overline{MN} \cong \overline{QP}$ | **3.** Opposite sides of a parallelogram are congruent |
| **4.** $\overline{MQ} \cong \overline{MQ}$ | **4.** Identity |
| **5.** $\angle NMQ$ and $\angle PQM$ are right angles | **5.** Def. of a rectangle |
| **6.** $\angle NMQ \cong \angle PQM$ | **6.** All right angles are congruent |
| **7.** $\triangle NMQ \cong \triangle PQM$ | **7.** SAS |
| **8.** $\overline{MP} \cong \overline{NQ}$ | **8.** CPCTC |

Popper 11

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