Answers for sample test

Math 142
Test II -- Fall 2003   100
Chapter 12 and 13.1-13.2   Seat: _____
Show any necessary work. Partial credit is based on work shown!
10pts *(good)*   6pts   See "Metric Measurement" *Module 4* handout
1. Complete the following statements: 2. Using something in this room, illustrate the size of:

13.1

  a. 26 cm = __260__ mm   a. one millimeter – *diameter of paper clip wire*
                                        (diameter of pencil lead or tip)
  b. 630 cm = __6.3__ meters   *(diameter of pen tip.)*

  c. 52 kilometers = __52000__ meters b. one meter: – *distance from doorknob to floor*
                                (distance from desk top to floor)
  d. 20° Celsius = __68°__ Fahrenheit   "   " nose to tip of finger

$\frac{9}{5}(20)+32 = 36+32$

  ~~e. 45 sq cm = 4500 sq mm~~   c. one centimeter – *diameter of pencil* or pen or chalk
                                  width of paper clip
  f. 500 cm^3 = __.5__ Liter   *(other possible answers)*

one decimeter – *distance across a hand.*

6pts
3. Choose the most realistic measure for each of the following objects:

13.1 Homework

  a. The height of a building: 205 centimeters, **205 meters**, or 205 kilometers.

  b. The mass (weight) of a tennis ball: 25 milligrams, **25 grams**, or 25 kilograms.

  c. The volume of a can of cola: **400 milliliters**, 400 centiliters, or 400 Liters.

4pts
4. True or false: (If false, correct the statement or tell why it is false.)

__False__ a. The central angle of any regular polygon has the same measure as any vertex angle
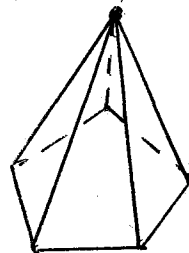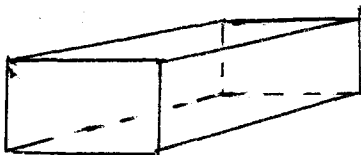   of the same polygon. *central ∠ = exterior ∠*

__True__ b. One liter of water has the mass of 1 kilogram.

8pts
12.5
5. a. Draw a **rectangular prism**   b. Draw a **pentagonal pyramid**
Correct bases (Be sure to use **dashed lines** for edges that cannot be seen.)
Correct prism or pyr.
(2pts dotted lines)

6pts
12.5
6. A **octagonal pyramid** has __9__ faces, __9__ vertices, and __16__ edges.

40pts

7. For each of the following, give a definition and then give an example using objects in this room:

a. skew lines — Lines in space that are not parallel and do not intersect.

The top edge of the white board + the side edge of the bulletin board are skew lines.

b. two intersecting planes — two planes intersect in a _line_

Ex: the front wall & side wall intersect in the line in the corner of the room

5pts

8. Put the following names in this Venn diagram to show the correct relationships between these quadrilaterals: **parallelograms, rectangles, rhombuses, squares, and trapezoids.**

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Quadrilaterals — parallelogram
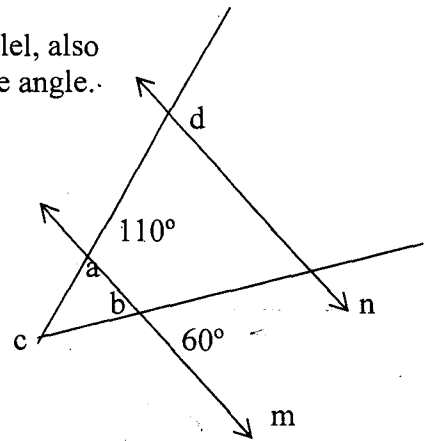
trapezoid   Rect sq Rh.
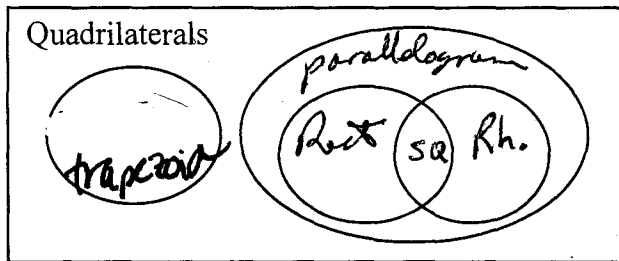
8pts

9. Find the missing angles in this figure where lines m and n are parallel, also name the relationship to another angle that you used to calculate the angle.

Angle a = __$70°$__ because Supplementary to 110°∠.

Angle b = __$60°$__ because Vertical ∠ to 60°

Angle c = __50__ because Sum of ∠s in △ = 180°

Angle d = __$110°$__ because Corresponding ∠s.
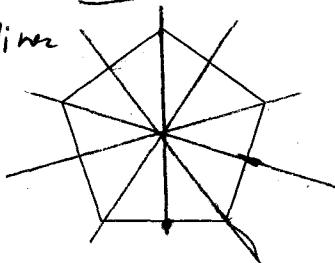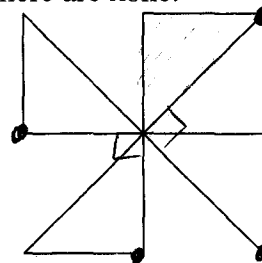
d

110°
a
b   n
c   60°

m

7pts

10. Draw in all the lines of symmetry for each figure or state there are none.

5 lines
a.

no lines
b. of sym

Trace a turn
to check your answer

4pts

11. What is the smallest number of degrees of rotational symmetry for each of the figures in problem 10?

a.   b.
$\frac{360}{5} = 72°$ $90°$ $180°$

32pts

12. a. What is the measure of one <u>exterior angle</u> of a regular hexagon? $60°$ $360°/6$ $\dfrac{360°}{n}$

  b. What is the measure of one <u>vertex angle</u> in a regular hexagon? $120°$ ← $(180-60)$

  $\left(180 - \dfrac{360}{n}\right)$

  c. Define a semi-regular tessellation.

  It is a tessellation made of <u>two or more regular polygons</u>
  with identical vertex arrangements. (1pt)   (1pt)

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  d. Can a semi-regular tessellation be made using regular <u>hexagons</u>, <u>squares</u> and <u>equilateral</u> triangles? __yes__   Explain, using the measures of the vertex angles of the figures:
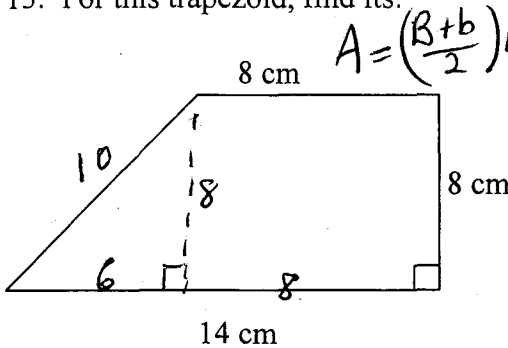
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  Each vertex would have $3-4-6-4$ arrangement

  1 hexagon + sq + $\triangle$ + sq = $120+90+60+90$

  $= 360°$
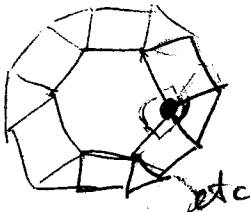
  -1pts if discussed semi-reg tessellation with only hex & $\triangle$
  -2pt if discussed regular tessellations with only one of these polygons

10pts   For # 13 & 14, include appropriate units with your answers.

13. For this trapezoid, find its:

13.2

$A = \left(\dfrac{B+b}{2}\right)h$ a. area: $5pts$ $5pts$ b. perimeter.

8 cm

10

8

8 cm

6   8

14 cm

$A = \left(\dfrac{8+14}{2}\right)(8)$

$A = \dfrac{22}{2} \cdot 8$

$A = 11 \cdot 8$

$A = 88\ cm^2$

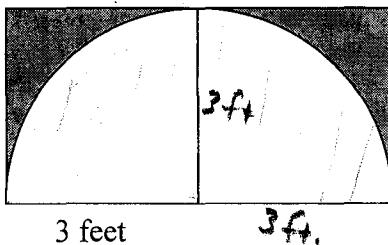(Use pythogorean thm to find missing side.
$6^2 + 8^2 = 10^2$

$P = 14 + 8 + 8 + 10$

$P = 40\ cm$

8pts

14. Find the area of the shaded region in the following figure. Note that the quadrilateral is a rectangle with a semicircle inside it. The radius of the semicircle is 3 feet.

13.2 Homework

3 ft

3 feet   3 ft.

$A_{rectangle} - A_{semicircle} = $ Area of shaded part

$A = \ell w - \frac{1}{2}\pi r^2$

$A = (6 \cdot 3) - \frac{1}{2}\pi(3^2)$

$A = \left(18 - \frac{9}{2}\pi\right) ft^2$ ok if left here

$A \approx 18 - 14.13)\approx \boxed{3.862}\ sq\ ft$ ok with 1 or 2 decimal places

OK

13.1

4pts

15. Show your work in making the following conversion.   (Note: 1 mile = 5280 feet.)
  The speed of sound is 1100 feet / second at sea level. Express this speed of sound in miles / hour.

$\dfrac{1100\ ft}{sec} \cdot \dfrac{60\ sec}{1\ min} \cdot \dfrac{60\ min}{1\ hr.} \cdot \dfrac{1\ mi}{5280\ ft} =$

$\dfrac{28}{}$

Outline of Math 142 Test II

Chapter 12 – Geometry

Section 1: Understanding basic geometry shapes, their properties, definitions and relationships between different shapes.

Section 2: Analyzing shapes: Lines of symmetry, rotational symmetry, regular polygons, convex and concave shapes.

Section 3: Basic definitions and relationships of lines, planes, angles, sum of angles in a triangle.

Section 4: Regular polygons and tessellations. Angle measures for vertex angles, exterior angles, and central angles of regular polygons. How the vertex angles of regular polygons determine what tessellations, if any, it is possible to create with them. How to name and discuss semiregular tessellations.

Section 5: 3-dimensional geometry: Understanding planes, skew lines, dihedral angles, pyramids, prisms and regular polyhedra. Be able to give examples from the classroom of 3-dimenstional concepts. Be able to draw pyramids and prisms and identify the number of vertices, edges and faces they have.

Chapter 13 – Measurement

Section 1: Metric system: Understand the units used in the metric system, using common examples as in homework problems. Be able to give classroom examples of common metric units. Be able to do conversions within standard English units and within metric units.

Section 2: Understand differences between perimeter and area of polygons and circles. Understand all the formulas to calculate perimeter and area of polygons and circles. Know the Pythagorean Theorem and how to use it to find measurements for sides or heights of various polygons. Be able to explain how the area formulas for simple figures are all related to the area of a parallelogram.

Review your class notes, homework problems and quizzes.
Practice the concepts by doing the chapter reviews.
Check your understanding by doing the chapter tests as a practice test.