

Answers for Sample Test

Nov 19, 2003

Math 142
Test III Fall 2003
Chapters 13 & 14

100

NAME: Key

Seat: _____

Show all your work since partial credit is based on work shown! Also be sure to include units with your answer where appropriate.

5pts (1 read)
1. To measure each item, select the most appropriate unit from this list:
mm, cm, m, km, mL, kg.

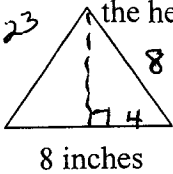
- a. length of this room: m
- b. volume of a can of cola: mL
- c. length of your textbook: cm
- d. distance from UNCW to UNCC: km
- e. weight of a person: kg

5pts
3. 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.

$$\frac{1100 \text{ ft}}{\text{sec}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \frac{750 \text{ mi}}{\text{hr}}$$

5pts
4. a. Use the pythagorean theorem to find the height in this equilateral triangle.



$$4^2 + h^2 = 8^2$$

$$h^2 = 64 - 16$$

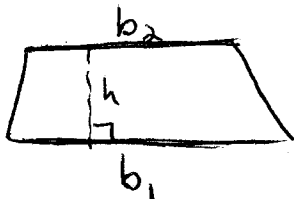
$$h^2 = 48$$

$$h = \sqrt{48} \text{ in}$$

$$h = \sqrt{16 \cdot 3} \text{ in}$$

$$h = 4\sqrt{3} \text{ in}$$

6pts
5. Draw a sketch of a trapezoid and give the formula for its area. (Label the sketch to go with your formula.)



$$A = \frac{1}{2}(b_1 + b_2)h$$

8pts (2 each)
2. Complete the following:

a. 7.6 meters = 760 centimeters

b. 5000 sq centimeters = .05 sq meters

c. 50° F = 10 °C

d. 1500 cubic cm = 1.5 Liters

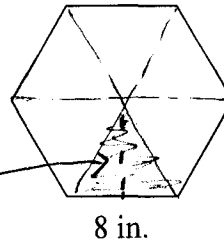
1500 mL

13.1

13.2
HW set B #23

3 pts
 $8^2 + 8^2 = 12^2$
 $h = \sqrt{128}$

7pts
4. b. Find the area of this hexagon.



$$A = 6 \left(\frac{1}{2} (8) (4\sqrt{3}) \right) \leftarrow 6As$$

$$\text{or } A = \frac{1}{2} h \cdot p$$

$$A = \frac{1}{2} (4\sqrt{3}) (6 \cdot 8) \leftarrow A = \frac{1}{2} ap$$

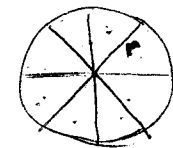
$$A = 96\sqrt{3} \text{ in}^2$$

$$A \approx 166.28 \text{ in}^2$$

(166.32 if used h = 6.93)

Lecture Notes
13.2

6. Explain how the formula for the area of a circle can be developed from the formula for the area of a parallelogram. Include a sketch. (Typical 6th grade method using pie shaped pieces.)



$$C = 2\pi r$$



$$A = bh$$

$$A = \frac{1}{2} C h$$

$$A = \frac{1}{2} (2\pi r) (r)$$

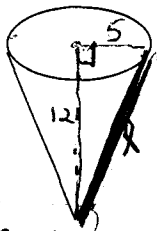
$$A = \pi r \cdot r$$

$$A = \pi r^2$$

$\left\{ \begin{array}{l} b = \frac{1}{2} C \\ h = r \end{array} \right.$

7. Pictured below is a "drumstick" ice cream cone with radius of 5 cm and height of 12 cm.

- a. What is the volume of ice cream in this cone? b. How much paper would it take to package the ice cream cone? (For each part, write a verbal description of the volume or surface area before you do the calculations.)



$V = \frac{1}{3}(\text{area of circle})(\text{height})$

$V = \frac{1}{3}(\pi 5^2)(12 \text{ cm})$

$V = \frac{1}{3}(25\pi)(12)$

$V = 100\pi \text{ cm}^3$

$V = 314 \text{ cm}^3$

-2 pts if used $b=10$ diameter instead of πr^2
 $\frac{1}{3} \cdot 10 \cdot 12 = 40 \text{ cm}^3$

$SA = \text{area of circle} + \text{area of lateral face of cone.}$

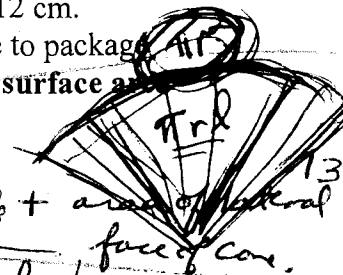
$SA = \pi r^2 + \pi r l$

$SA = \pi 5^2 + \pi 5(13)$

$SA = 25\pi + 65\pi$

$SA = 90\pi \text{ cm}^2$

$SA \approx 282.74 \text{ cm}^2$



13.3+4
HW # 2 cond
SA A

$l^2 = 12^2 + 5^2$
 $l^2 = 144 + 25$
 $l^2 = 169$
 $l = \sqrt{169}$
 $l = 13$

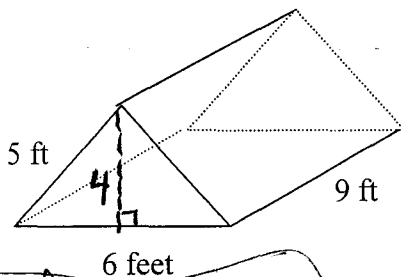
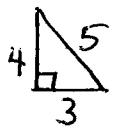
16pts

8. The end of the tent pictured below is an isosceles triangle, with a base of 6 feet and other sides of 5 feet. The tent is 9 feet long.

- a. What is the volume of air inside the tent?

- b. How much material would it take to make this tent?

(For each part, write a verbal description of the formula before you do the calculations.)



$V = Ah$

$V = (\text{area of } \Delta)(\text{distance bet } \Delta s)$

$V = \frac{1}{2}(6)(4)(9)$

$V = (12)(9)$

$V = 108 \text{ ft}^3$

- 3 pts if multi (area of rectangle) x (h=4)

$SA = (\text{area of } 2 \Delta s) + \text{area of } 3 \text{ rect.}$

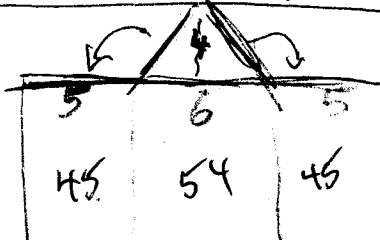
$SA = 2(\frac{1}{2} \cdot 6 \cdot 4) + (5 \cdot 9) + (5 \cdot 9) + (6 \cdot 9)$

$SA = 2A + ph$

$SA = 2(12) + (5+5+6) \cdot 9$

$SA = 24 + 144$

$SA = 168 \text{ ft}^2$



45) 90
45) 54
54) 144

32

13.3 or
13.4
HW # 16

see chapter tests

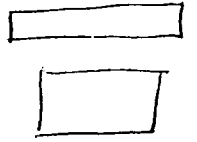
6pts

7. True or false? If false, explain why or correct the statement.

or $2\pi r(r+h)$

false a. The formula for the surface area of a circular cylinder is $\pi r^2 + 2\pi r h$.

false b. All rectangles are ^{not} similar. Not same shape all \square s are \sim

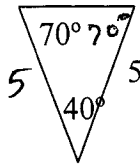
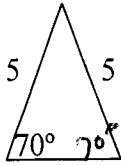


true c. One cubic centimeter of water has a mass of 1 gram.

5pts

8. Is the following pair of triangles congruent? yes Justify your conclusion.

$180 - (70 + 40) = 70^\circ$



Isosceles Δ so base \angle s are both 70° and other \angle is 40° .

So Δ s are \cong by SAS

or by ASA

10pts

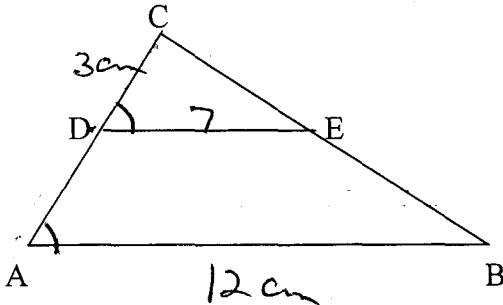
9. a. If $\angle CAB \cong \angle CDE$ in the figure below, explain why triangles ABC and DEC are similar triangles.

$\angle CAB \cong \angle CDE$ given
 $\angle C = \angle C$ same \angle in both Δ s

Thus $\Delta ABC \sim \Delta DEC$ by AA

4pts

b. The length of DE is 7 cm, AB is 12 cm and CD is 3 cm. Find the length of CA. Solve using a proportion. Show your work. (not drawn to scale)



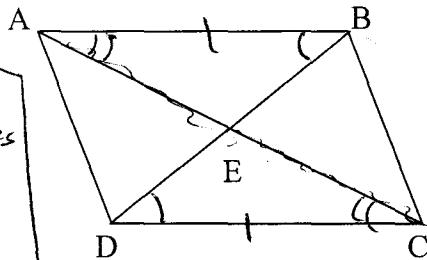
$\frac{3}{CA} = \frac{7}{12}$

$7CA = 3(12)$

$7CA = 36$

$CA \approx 5.14$ cm

10. Prove that the diagonals of a parallelogram bisect each other.



$\angle EBA \cong \angle EDC$ because alt. int \angle s are \cong $\left. \begin{matrix} \\ \\ \end{matrix} \right\} AB \parallel CD$
 $\angle EAB \cong \angle ECD$ because " " " " " " " "

$AB \cong CD$ because opposite sides of parallelogram are \cong

Therefore $\Delta ABE \cong \Delta CDE$ because ASA

Thus $AE \cong CE$ and $BE \cong DE$ because corresponding parts of \cong Δ s are equal.

Thus diagonals bisect each other.

set A
14.1 #5

set A
14.2
#3+6

set A
14.5 #4

also see
lecture notes
for other
proofs