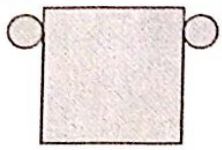
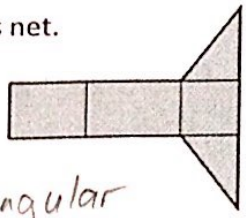
Final Exam Review #3

Choose the shape that is represented by this net.

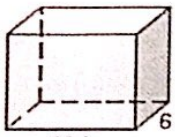
(1) 

Cylinder

(2) 

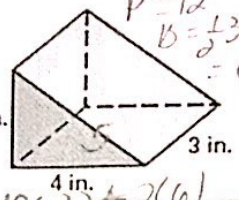
Triangular prism

Find the surface area of each shape below.

(3) 

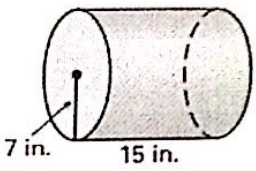
Peri = 2(8)+2(6) = 36 B = 12(6)

SA = 36(8) + 2(72) = 288 + 144 = 432 in²

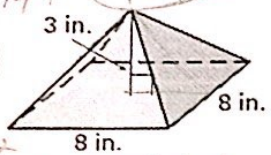
(4) 

P = 12 B = ½(3)(4) = 6

SA = 12(3) + 2(6) = 36 + 12 = 48 in²

(5) 

SA = 2π(7)(15) + 2π(7)² = 210π + 98π = 308 in²

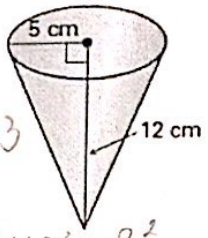
(6) 

P = 32

l² = 3² + 4² = 5

B = 8(8) = 64

SA = ½(32)5 + 64 = 144 in²

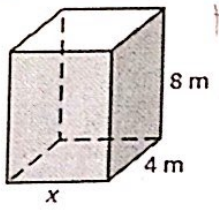
(8) 

5² + 12² = l²

13 = l

SA = π(5)(13) + π(5)² = 65π + 25π = 90π

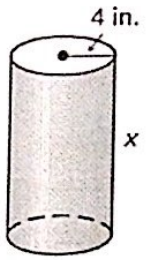
Solve for the variable given the surface area, S, of the right prism, right cylinder, or regular pyramid. Round the result to one decimal point.

(9) $S = 208$ m² 

S = PH + 2B

208 =

P = 8 + 2x

(10) $S = 452.4$ in.² 

S = 2πrh + 2πr²

452.4 = 2(3.14)h + 2(3.14)16

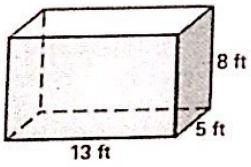
452.4 = 6.28h + 100.48

−100.48 −100.48

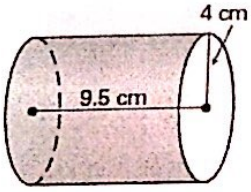
351.92 = 6.28h

56.04 = h

Find the volume of the shapes below.

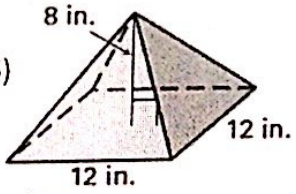
(12) 

V = 13(5)8 = 520 ft³

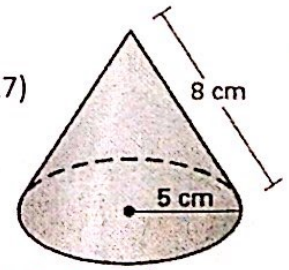
(15) 

V = π(4)²(9.5) = 152π cm³

B = 12(12) = 144

(16) 

V = ⅓Bh = ⅓(144)8 = 384 in³

(17) 

h² + 5² = 8²

h² + 25 = 64

h² = 39

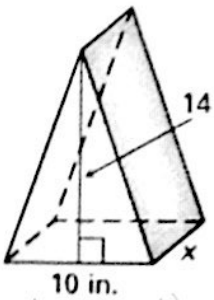
h = 6.2

V = ⅓πr²h = ⅓π(5)²(6.2) = 51.7π cm³

Match the missing values with the given volumes.

Volume = 455 in.^{3}

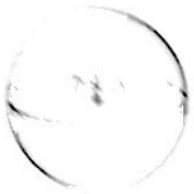
(19)



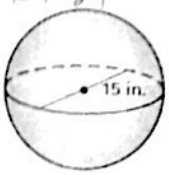
$V = \frac{1}{2}(10)(14) \cdot 70$

(21) Find the surface area and volume of a hemisphere.

Find the surface area and volume of the sphere.



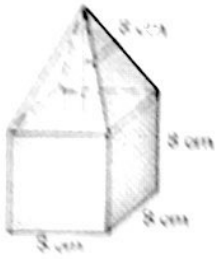
took $\frac{1}{2}$ of



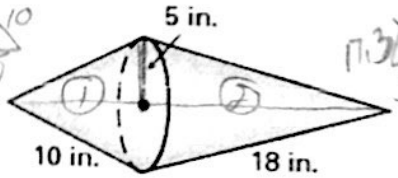
$SA = 2\pi r^2$
$= 2\pi(7.5)^2$
$= 112.5\pi \text{ in}^2$

$V = \frac{\frac{4}{3}\pi r^3}{2} = \frac{\frac{4}{3}\pi(7.5)^3}{2} = 281.25\pi$

Find the volume of these pictures below.



(23)

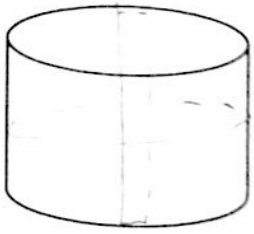


$V_{cone1} = \frac{1}{3}\pi r^2 h$
$= \frac{1}{3}\pi(5)^2(8.7)$
$= 72.5\pi$

$V_{cone2} = \frac{1}{3}\pi(5)^2(17.3)$
$= 144.2\pi$

Together $72.5\pi + 144.2\pi$
$= 216.7\pi$

(24) Use the cylinder to answer the following:



a. What is the cross-section when sliced horizontally?

Circle

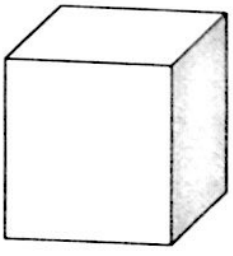
b. What is the cross-section when sliced vertically?

Rectangle (think soup can label)

c. How many planes of symmetry are there?

∞

(25) Use the cube to answer the following:



a. What is the cross-section when sliced horizontally?

Square

b. What is the cross-section when sliced vertically?

Square

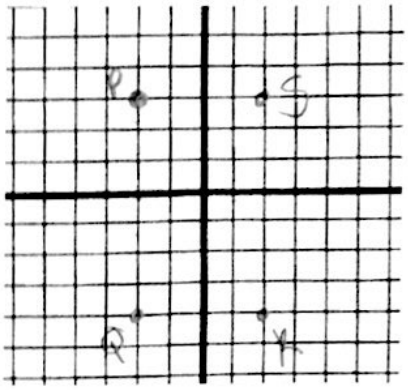
c. How many planes of symmetry are there?

Inf

(26)

Given that PQRS is a parallelogram, determine if it is a rectangle, square, rhombus, or none of them

P(2, 3)
Q(2, -4)
R(2, -4)
S(2, 3)



(27) List the properties of parallelograms. opp sides ≅, opp sides ∥, cons sec $\measuredangle$s supp, opp angles ≅

(28)

$WXYZ$ is a square.

$WX = 1 - 10x$

$YZ = 14 + 3x$

$XY =$

$WXYZ$ is a rhombus.

$m\angle X = 24(10 - x)°$

$m\angle Z = 6(x + 15)°$

$m\angle Y =$ 2°60°

$24(10-x) = 6(x+15)$

$240 - 24x = 6x + 90$

$+24x \quad +24x$

$240 = 30x + 90$

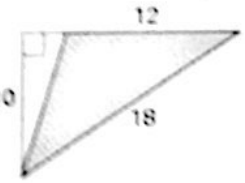
$-90 \quad -90$

$\frac{150}{30} = \frac{30x}{30}$

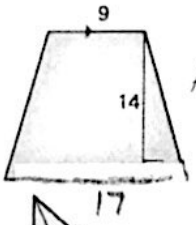
$5 = x$

Find the area of the figures below.

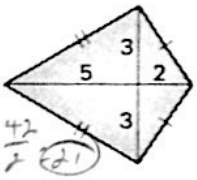
(30)



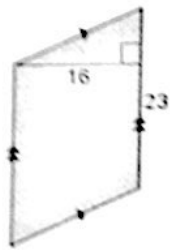
(31)



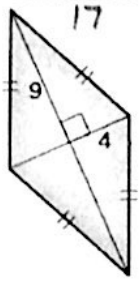
(32)



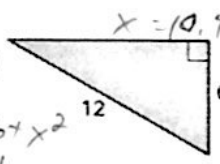
(33)



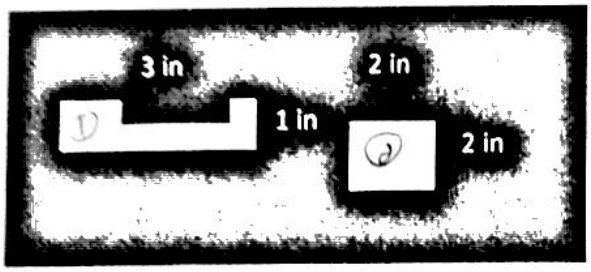
(34)



(35)



Find the area of the shaded region:



4 in

12 in

Area entire thing $12(4) = 48$

$A_1 =$

$A_2 = 2(2) = 4$

(37) State if the triangle is acute, obtuse, or right.

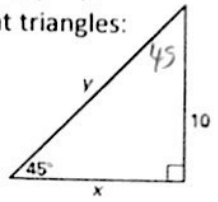
a) 5, 12, 13 $13^2 = 5^2 + 12^2$ $169 = 25 + 144$ Right

(b) 4, 7, 15 $225 \geq 65$ $15^2 = 4^2 + 7^2$ $225 = 16 + 49$ Obtuse

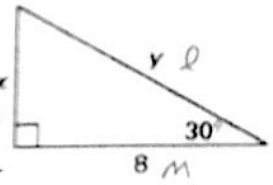
(c) 7, 8, 9 $9^2 = 7^2 + 8^2$ $81 = 49 + 64$ $81 = 113$ $81 < 113$ acute

(38) Find the missing sides for the right triangles:

a) x = 10 y = $10\sqrt{2}$



b) x = $\frac{8}{\sqrt{3}}$ 4.61 y = $\frac{16}{\sqrt{3}}$ 9.22

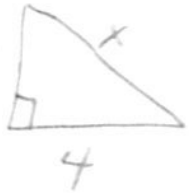


$\tan 30 = \frac{x}{8}$

$8 \tan 30 = x$

(39) The legs of a right triangle are 2 feet and 4 feet. Find the hypotenuse for the triangle. Draw a picture.

a. Find the exact answer (simplest radical form). $\sqrt{20}$
b. Find the answer to the nearest tenth. 4.5
c. Which answer is more useful in for real world measurement. (4.5)



$2^2 + 4^2 = x^2$

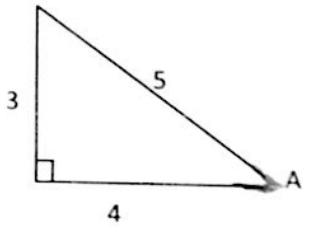
$4 + 16 = x^2$

$20 = \sqrt{x^2}$

(40)

Find sine, cosine, and tangent ratios of A:

$\sin A = \frac{3}{5}$ $\cos A = \frac{4}{5}$ $\tan A = \frac{3}{4}$



(41)

Find the missing side:

x = 9.23 y = 9.7

$\frac{\tan 72}{1} = \frac{x}{3}$

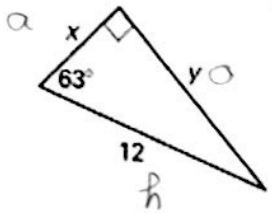
$3 \tan 72 = x$

$9.23 = x$

$\frac{\cos 72}{1} = \frac{3}{y}$

$\frac{y \cos 72}{\cos 72} = \frac{3}{\cos 72}$

b) x = 5.3 y = 10.7



$\frac{\sin 63}{1} = \frac{y}{12}$

$12 \sin 63 = y$

$10.69 = y$

$12^2 = (10.7)^2 + x^2$

$144 = 114.5 + x^2$

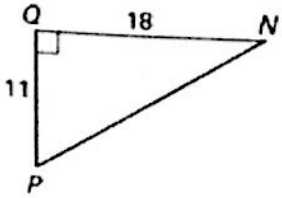
$-114.5 \quad -114.5$

$\sqrt{29.5} = \sqrt{x^2}$

$5.4 = x$

(42) Find the missing angle:

a) m<P = 58.6°

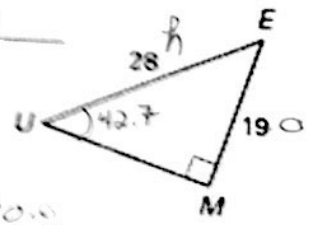


$\tan P = \frac{18}{11}$

$\angle P = \tan^{-1}(18/11)$

$= 58.57$

b) m<U= 42.7 m<E = 47.3



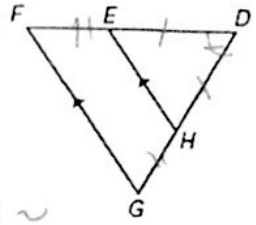
$\sin U = \frac{19}{28}$

$\angle U = \sin^{-1}(19/28)$

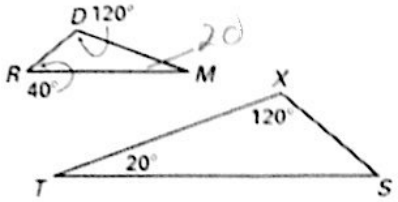
$= 42.7$

$90.0 - 42.7 = 47.3$

Are these triangles similar? If so, name the theorem or postulate.

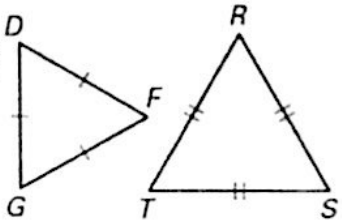
(58) 

Yes
SAS~

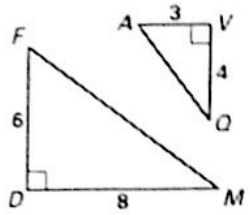
(59) 

120
+40
160
180
-160
20

Yes AA~

(60) 

Yes
SSS~

(61) 

$\frac{6}{3} = 2$

$\frac{8}{4} = 2$

Yes SAS~

(62) Find the measure of an interior angle of a regular: Sum of measures $(n-2)\cdot 180$

$(6-2)\cdot 180 = 720/6$ $(8-2)180 = 1080/8$ $(12-2)180 = 1800/12$

(a) Hexagon $= 120°$ (b) Octagon $= 135°$ (c) 12-gon $= 150°$

(63) Find the measure of an exterior angle of a regular: $360°$

(a) Pentagon $360/5 = 72°$ (b) Nonagon $360/9 = 40°$ (c) Triangle $360/3 = 120°$

(64) If the exterior angle of a regular polygon is 60°, how many sides does the polygon have?

$\frac{360}{x} = \frac{60}{1}$ $\frac{360}{60} = \frac{60x}{60}$ $x = 6$

Must check

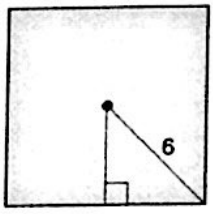
(65) If the interior angle of a regular polygon is 160°, how many sides does the polygon have?

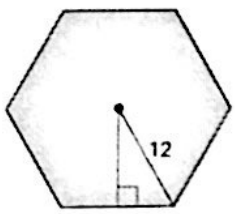
$\frac{(n-2)180}{n} = \frac{160}{1}$ $160n = (n-2)180$ $160n = 180n - 360$ $-180n \quad -180n$ $\frac{-20n}{-20} = \frac{-360}{-20}$ $n = 18$

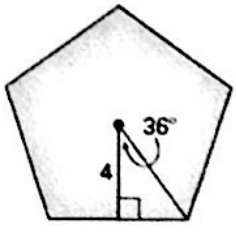
Find the area of each regular polygon.

(66) (67) (68)

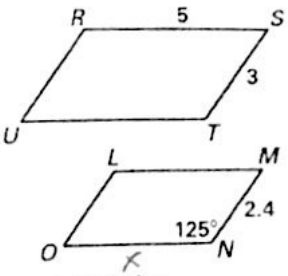
On separate sheet of paper.







(45) $\frac{3}{2.4} = \frac{1}{0.8}$ (46) $\frac{2.4}{3} = \frac{0.8}{1}$



(45) Find the scale factor of the big quadrilateral to the small quadrilateral.

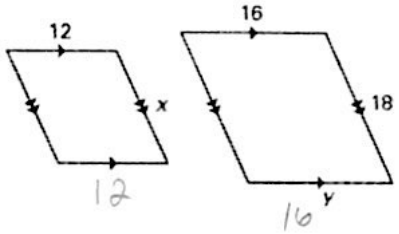
(46) Find the scale factor of the small quadrilateral to the big quadrilateral.

(47) Assuming these are parallelograms, find the length of $\overline{NO}$ and the measure of and the measure of <U. $\frac{3}{2.4} = \frac{5}{x}$ $\frac{3x}{3} = \frac{12}{3}$ $x = 4$

(48) Find the ratio of the perimeters of the parallelograms WITHOUT ACTUALLY FINDING THE PERIMETER. $\frac{1}{0.8}$

(49)Find the ratio of the areas of the parallelograms WITHOUT ACTUALLY FINDING THE AREAS. $\left(\frac{1}{0.8}\right)^2$ $\frac{1}{0.64}$

(50) These parallelograms are similar. Find x and y.



$\frac{12}{16} = \frac{x}{18}$

$216 = 16x$

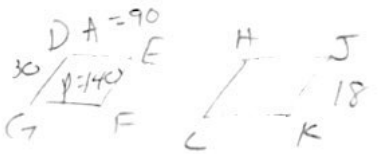
$\frac{216}{16} = \frac{16x}{16}$

$13.5 = x$

opp sides $\cong$ so

$y = 16$

(51) In similar parallelograms DEFG and HJKL, DG=30 and KJ=18.



(a) The perimeter of DEFG is 140. Find the perimeter of HJKL. $\frac{30}{18} = \frac{140}{x}$ $30x = 2520$ $x = 84$

(b) The area of DEFG is 90. Find the area of HJKL.

$\frac{30}{18}$ Reduce $\div 6 = \frac{5}{3}$ New square $\left(\frac{5}{3}\right)^2 = \frac{90}{x}$ $\frac{25}{9} = \frac{90}{x}$ $\frac{25x}{25} = \frac{180}{25}$ $x = 7.2$

Fill in the blanks with always, sometimes, or never.

(52) A square is always a rectangle.

(53) A rectangle is sometimes a square.

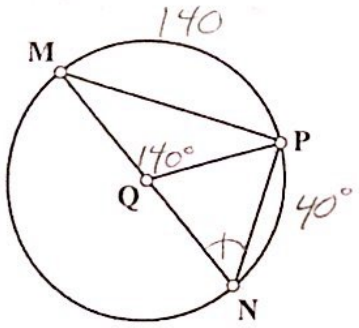
(54) A trapezoid is never a parallelogram.

(55) A square is sometimes a rhombus.

(56) A trapezoid sometimes has two pairs of base angles that are congruent.

(57) A rectangle is never a rhombus.

(75) $\overline{MN}$ is the diameter of circle Q. The m<PQM = 140°



Find $m < PNM$: 70° $\frac{140}{2} = 70$

Find $\overset{\frown}{PN}$: 40° $180 - 140 = 40$

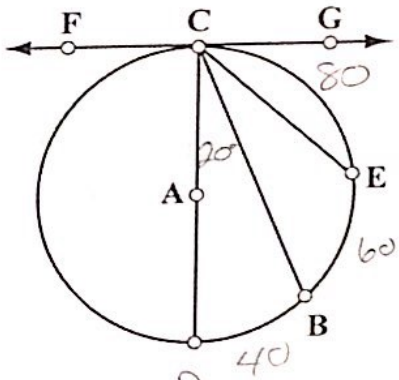
Find $m < PMN$: 20° $\frac{40}{2} = 20°$

(78)

$\overleftrightarrow{FG}$ is tangent to circle A. $m < DCB = 20°$ $\overset{\frown}{CE} = 80$

$m < GCE =$ 40° $\frac{80}{2}$

$m < BCE =$ 60°



$20 \times 2 = 40 = \overset{\frown}{DB}$

$80 + 40 = 120$

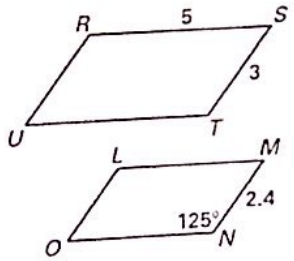
$180 - 120 = 60$

(79)

Convert the units:

a. 10 m = 10,000 cm $1m = 100cm = 10(100)$
b. 6 yd = 72 in $1yd = 3feet = 12in$ $12(6) = 72$
c. 4 hrs = 240 minutes $4(60) = 240$
d. 12 in = 1 ft

(49)Find the ratio of the areas of the parallelograms WITHOUT ACTUALLY FINDING THE AREAS.



Already did!

$A = \frac{1}{2}aP \quad P = 12(4.3) = 51.6$

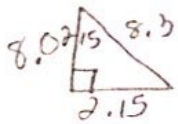
(69) In a regular dodecagon (12 sided), each side length is 4.3 and the radius is 8.3. Find the area.

$\frac{360}{12} = 30/2 = 15$

$A = \frac{1}{2}(8.02)(51.6)$

$A = 206.916$

(70)



used pyth instead of trig.

$\overline{MQ}$ and $\overline{NR}$ are diameters. Find the indicated measure.

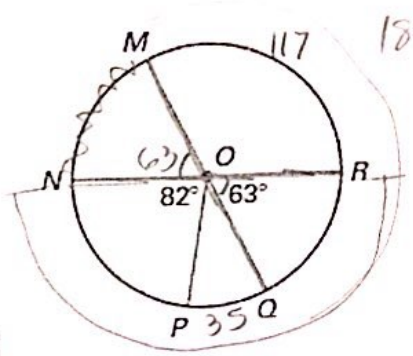
(a) $m\widehat{NQ} = 63°$

(b) $m\widehat{MRP} = 215°$

(c) $m\widehat{MR} = 117°$

(d) $m\widehat{PQ} = 35°$

(e) $m\widehat{MQN} = 297°$

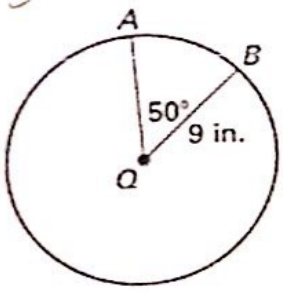


(71)

Find $\widehat{AB}$ $= 50°$

Arc length

$AB = \frac{m\widehat{AB}}{360} \cdot 2\pi r$



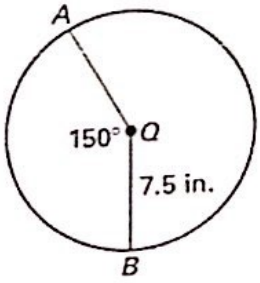
$= \frac{50}{360} \cdot 2\pi(9)$

$= 7.85in$

(72)

Find $\widehat{AB}$

$AB = \frac{m\widehat{AB}}{360} \cdot 2\pi r$

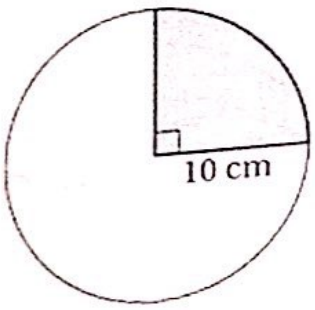


$= \frac{150}{360} \cdot 2\pi(7.5)$

$= 19.63$

Calculate the area of each shaded sector

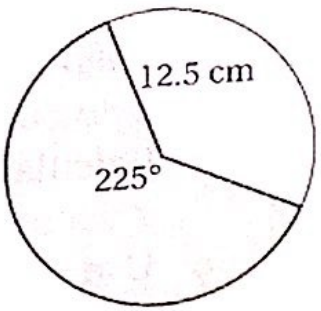
(73) $AB = \frac{m\widehat{AB}}{360} \cdot \pi r^2$



$= \frac{90}{360} \cdot \pi(10)^2$

$= 78.5cm^2$

(74) $AB = \frac{m\widehat{AB}}{360} = \pi r^2$



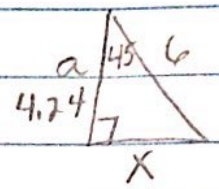
$= \frac{225}{360} \cdot \pi(12.5)^2$

$= 306.64\ cm^2$

#66 

Central angle

$\frac{360}{4} - \frac{90}{2} = 45$



$\cos 45 = \frac{a}{6}$

$6 \cos 45 = a$

$4.24 = a$

$A = \frac{1}{2} a P$

$= \frac{1}{2}(4.24)(33.92)$

$= 71.91$

$\sin 45 = \frac{x}{6}$

$6 \sin 45 = x$

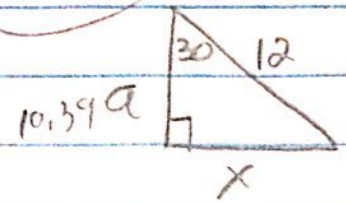
$4.24 = x$

Whole side length

$4.24(2) = 8.48$

$Perimeter = 8.48(4) = 33.92$

#67



Central angle

$\frac{360}{6} - \frac{60}{2} = 30$

$\frac{\cos 30}{1} = \frac{a}{12}$

$12 \cos 30 = a$

$10.39 = a$

$A = \frac{1}{2} a P$

$= \frac{1}{2}(10.39)(72)$

$= 374.04$

$\frac{\sin 30}{1} = \frac{x}{12}$

$12 \sin 30 = x$

$6 = x$

Whole side $6(2) = 12$

Peri $= 12(6) = 72$

1 4

$4 \tan 36 = x$

$2.91 = x$

Whole side: $2.91(2) = 5.82$

Peri $= 5.82(5) = 29.1$

$A = \frac{1}{2} a P$

$= \frac{1}{2}(4)(29.1)$

$= 58.2$