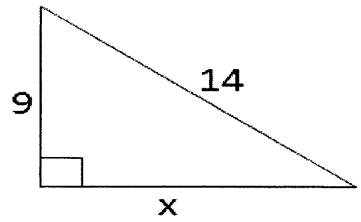
Geometry
Semester 2 Review
Chapter 7

Name: Answer Key

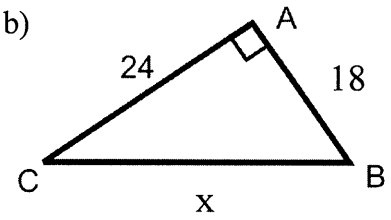
Find the unknown side length. Round to the nearest hundredth if needed.

1.) a)



$x^2 + 9^2 = 14^2$
$-9^2 \quad -9^2$
$\sqrt{x^2} = \sqrt{115}$
$x = 10.72$

b)



$18^2 + 24^2 = x^2$
$\sqrt{900} = \sqrt{x^2}$
$30 = x$

2.) Given the three side lengths. Classify the type of triangle.

a) 21, 20, 28

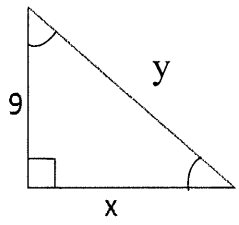
$21^2 + 20^2 \quad 28^2$
$441 + 400 \quad 784$
$841 > 784$
acute △

b) 14, 50, 40

$14^2 + 40^2 \quad 50$
$196 + 1600 \quad 2500$
$1796 < 2500$
obtuse △

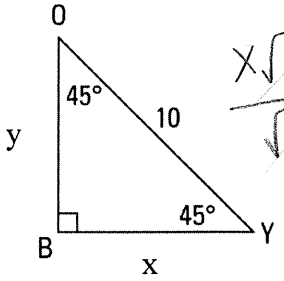
3.) Using the rules of special right triangles, find the ***x*** and ***y***. Write answer in simplest radical form.

a)



$x = 9$
$y = 9\sqrt{2}$

b)



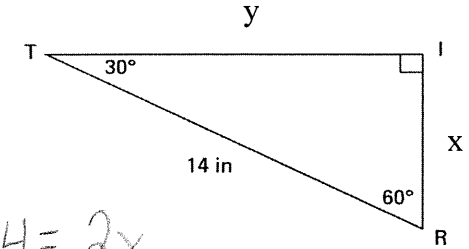
$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{10}{\sqrt{2}}$

$y = 5\sqrt{2}$

$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

c)

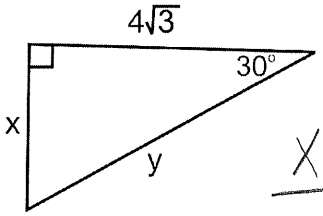


$\frac{14}{2} = \frac{2x}{2}$

$7 = x$

$y = 7\sqrt{3}$

d)



$\frac{x\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{\sqrt{3}}$

$x = 4$

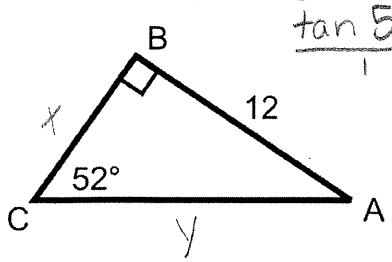
$y = 2(4)$

$y = 8$

SOH-CAH-TOA

4.) Solve each right triangle.

a)



$\frac{\tan 52}{1} = \frac{12}{x}$ $x = \frac{12}{\tan 52} = 9.38$

$90 - 52 = m\angle A$

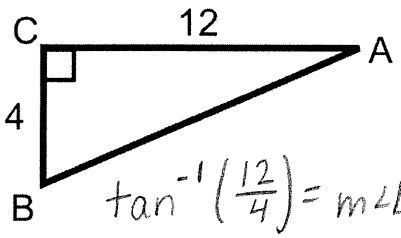
$38° = m\angle A$

$\frac{\sin 52}{1} = \frac{12}{y}$ $\frac{y \sin 52}{\sin 52} = \frac{12}{\sin 52}$

$y = 15.23$

BC= 9.38, $m\angle A$ = 38°, CA= 15.23

b)



$4^2 + 12^2 = AB^2$

$\sqrt{160} = \sqrt{AB^2}$ $12.65 = AB$

$\tan^{-1}\left(\frac{12}{4}\right) = m\angle B$

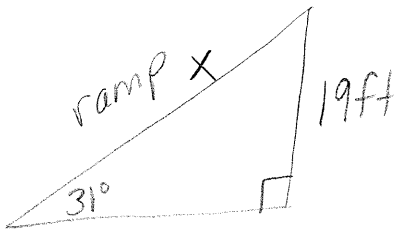
$71.6° = m\angle B$

$90 - 71.6 = m\angle A$

$18.4° = m\angle A$

BA= 12.65, $m\angle A$ = 18.4, $m\angle B$ = 71.6°

5.) When getting off an airplane there is a ramp from the door to the ground. The airplane door is 19 feet off the ground and the ramp has a 31° angle of elevation. What is the length of the ramp?



$\frac{\sin 31°}{1} = \frac{19}{x}$

$\frac{x \sin 31}{\sin 31} = \frac{19}{\sin 31}$

$x = 36.89$ ft

Chapter 8

1.) Find the sum of the measures of the interior angles of a 18-gon.

$n = 18$ $(18-2)180$

$16(180) = 2880°$

2.) Find the sum of the measures of the exterior angles of 14-gon.

360°

3.) Find the measure of one exterior and interior angle of a regular 24-gon. $n = 24$

$\frac{(24-2)180}{24} = \frac{3960}{24} = 165°$ $\frac{360}{24} = 15$

Interior angle: 165° Exterior angle: 15°

4.) The diagonals of rhombus PQRS interest at T. Given that $m\angle RPS = 28°$ and $RT = 6$ ft find the indicated measure. Rounds answers to the nearest tenth.

a.) $m\angle QTP$ = 90°

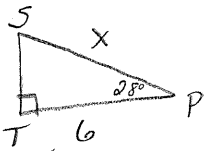
b.) $m\angle QPR$ = 28°

c.) $m\angle PSR$ = 62(2) = 124°

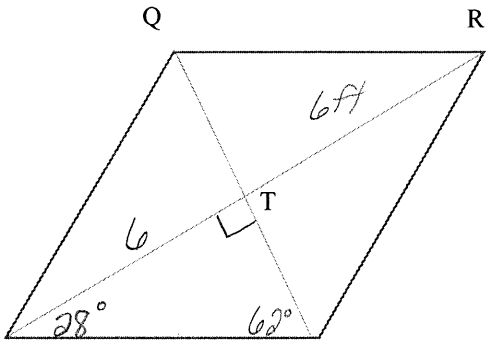
d.) TP = 6 ft

e.) PR = 2(6) = 12 ft

f.) PS



$\frac{\cos 28}{1} = \frac{6}{x}$ $\quad x\cos 28 = 6$ $\quad \frac{x\cos 28}{\cos 28} = \frac{6}{\cos 28}$ $\quad x = 6.80$ ft



90 − 28 = 62

5.) The diagonals of rectangle WXYZ interest and P. Given that $m\angle YXZ = 54°$ and $XZ = 18$ in, find the indicated measure. Rounds answers to the nearest tenth.

a.) $m\angle WXZ$ = 90 − 54 = 36°

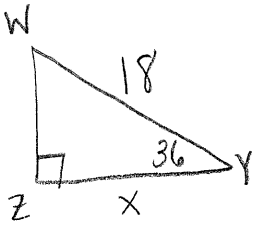
b.) $m\angle WPX$ $180 = 36 + 36 + x$, $-72 \quad -72$, $108° = m\angle WPX$

c.) $m\angle XPY$ = 180 − 108 = 72°

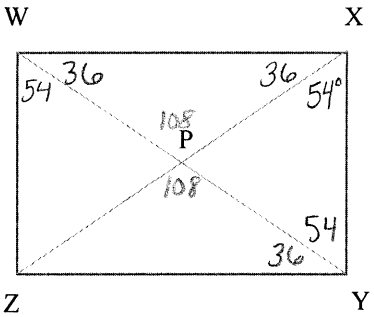
d.) PZ = 9 in

e.) PY = 9 in

f.) YZ

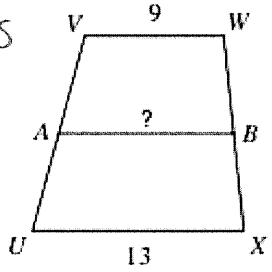


$\frac{\cos 36}{1} = \frac{x}{18}$ $\quad 18\cos 36 = x$ $\quad 14.56 \text{ in} = x$



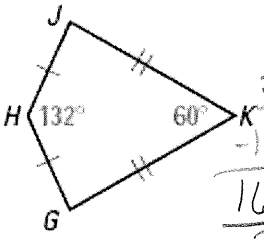
6.) Find the length of them median of trapezoid UVWX

AB= 11 units



$\frac{9+13}{2} = \frac{22}{2}$

7.) Find $m\angle J$ = 84°



$360 = 132 + 60 + x + x$

$360 = 192 + 2x$

$-192 \quad -192$

$\frac{168}{2} = \frac{2x}{2}$

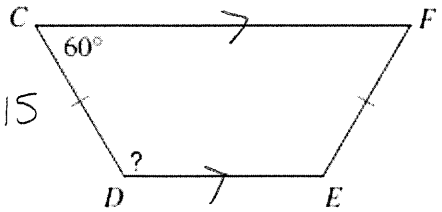
$84 = x$

8.) If CD = 15cm, find the measures below:

$m\angle F$ = 60° $\quad m\angle D$ = 120°

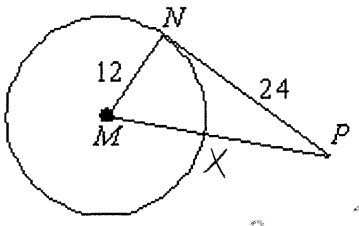
$m\angle E$ = 120° $\quad EF$ = 15 cm

180 − 60



Chapter 10

1.) $\overline{NP}$ is tangent to $\odot M$ at N. Find MP.

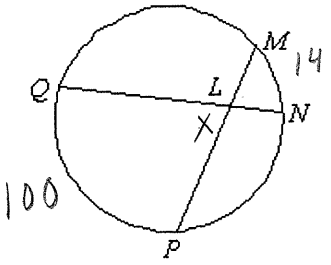


$12^2 + 24^2 = x^2$

$\sqrt{720} = \sqrt{x^2}$

$26.83 = x$

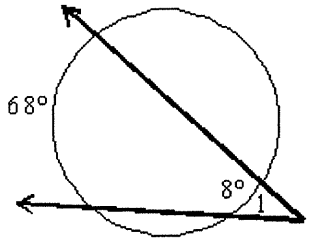
2.) Given: $m\widehat{MN} = 14°$ and $m\widehat{QP} = 100°$. Find $m\angle QLP$.



$X = \frac{1}{2}(100+14)$

$X = 57°$

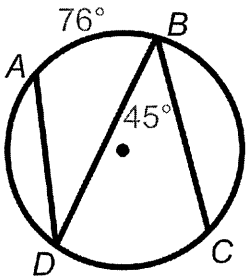
3.) Find the measure of $\angle 1$



$m\angle 1 = \frac{1}{2}(68-8)$

$m\angle 1 = 30°$

4.) Find $m\angle ADB$ and $m\widehat{DC}$



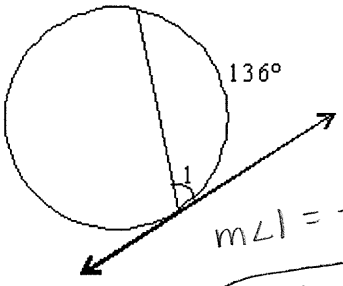
$m\angle ADB = \frac{1}{2}(76)$

$m\angle ADB = 38°$

$m\widehat{DC} = 45(2)$

$m\widehat{DC} = 90°$

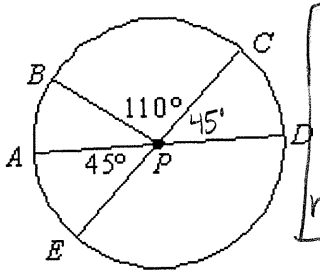
5.) Find the measure of $\angle 1$



$m\angle 1 = \frac{1}{2}(136)$

$m\angle 1 = 68°$

6.) Find $m\widehat{DC}, m\widehat{BC}, m\widehat{BA}$, if $\overline{CE}$ and $\overline{AD}$ are diameters.



$m\widehat{DC} = 45$

$m\widehat{BC} = 110°$

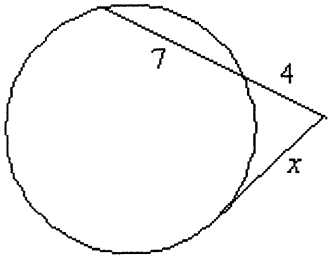
$m\widehat{BA} = 25°$

$110 + 45 + x = 180$

$-155 \quad -155$

$x = 25$

7.) Find the value of x.
Round to nearest tenth.



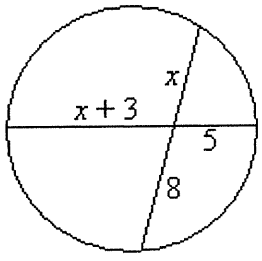
$x^2 = 4(4+7)$

$x^2 = 4(11)$

$\sqrt{x^2} = \sqrt{44}$

$x =$ 6.6 units

8.) Find the value of x.



$8x = 5(x+3)$

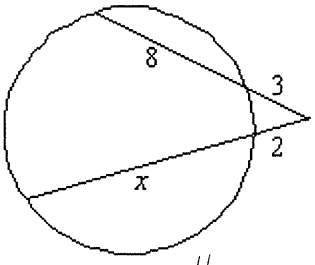
$8x = 5x + 15$

$-5x \quad -5x$

$\frac{3x}{3} = \frac{15}{3}$

$x = 5$

9.) Find the value of x.



$3(3+8) = 2(2+x)$

$33 = 4 + 2x$

$-4 \quad -4$

$\frac{29}{2} = \frac{2x}{2}$

$x = 14.5$

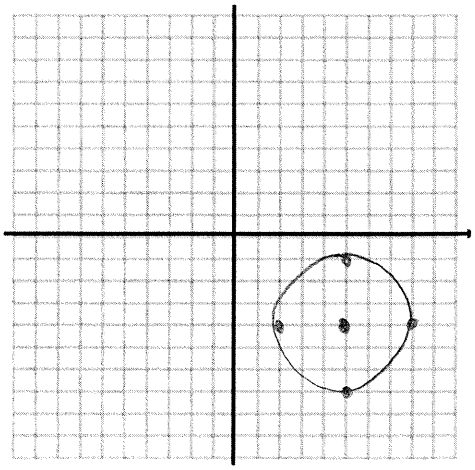
10.) Graph the equation.

$(x-5)^2 + (y+4)^2 = 9$

Center

$(5, -4)$

$r = \sqrt{9} = 3$



11.) Find the center and radius of a circle that has the standard equation: $(x+6)^2 + (y-3)^2 = 49$

Center: $(-6, 3)$ $\quad r = \sqrt{49} = 7$

12.) Write the standard equation of the circle with the given center and radius

a) Center (9, -2), Radius 8

8^2

$(x-9)^2 + (y+2)^2 = 64$

b) Center (-3, 6), Radius 1.4

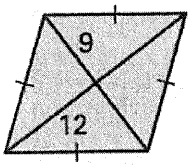
1.4^2

$(x+3)^2 + (y-6)^2 = 1.96$

Chapter 11

Find the area of the figure- label your answers.

1.)

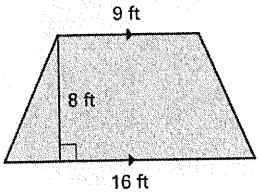


$d_1 = 12(2) = 24$

$d_2 = 9(2) = 18$

$A = \frac{24 \cdot 18}{2} = 216\ u^2$

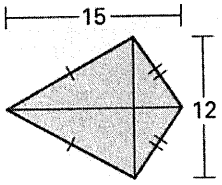
2.)



$A = \frac{(9+16)8}{2}$

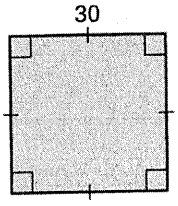
$A = 100\ ft^2$

3.)



$A = \frac{15 \cdot 12}{2} = 90\ u^2$

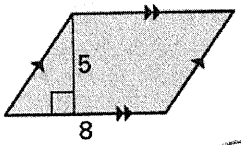
4.)



$A = 30^2$

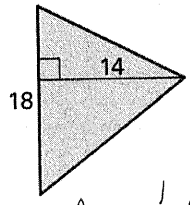
$A = 900\ units^2$

5.)



$A = 8 \cdot 5 = 40\ u^2$

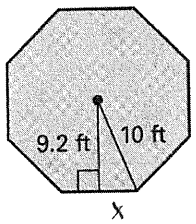
6.)



$A = \frac{1}{2}(14 \cdot 18)$

$A = 126\ u^2$

7.)



$P = 7.84(8) = 62.72$

$a = 9.2$

$A = \frac{9.2(62.72)}{2}$

$A = 288.51\ ft^2$

$9.2^2 + x^2 = 10^2$

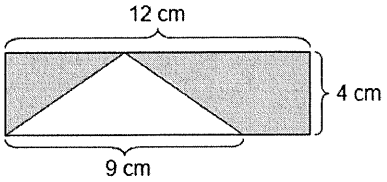
$-9.2^2 \quad -9.2^2$

$\sqrt{x^2} = \sqrt{15.36}$

$x = 3.92$

$Side = 2(3.92) = 7.84$

8.) Area of the shaded region



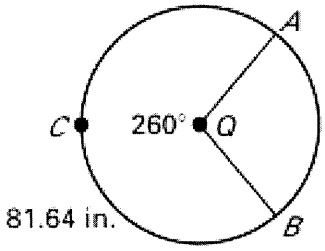
$A_{\square} - A_{\triangle}$

$12 \cdot 4 - \frac{1}{2}(9 \cdot 4)$

$48 - 18$

$30\ cm^2 = A$

9.) Use $\odot Q$ to find the indicated measures. Round to the measures to the nearest hundredth if necessary and label your answers.



a.) $m\overset{\frown}{ACB} = 260°$

b.) Arc Length $\overset{\frown}{ACB} = 81.64\ in$

c.) Radius of $\odot Q$

$\frac{81.64}{2\pi r} = \frac{260}{360}$

$\frac{29390.4}{520\pi} = \frac{520\pi r}{520\pi}$

$17.99\ in = r$

d.) $m\overset{\frown}{AB} = 360 - 260$

$= 100°$

e.) Arc Length $\overset{\frown}{AB}$

$\frac{x}{2\pi 17.99} = \frac{100}{360}$

$\frac{360x}{360} = \frac{11303.45}{360}$

$x = 31.40\ in$

f.) Circumference of $\odot Q$

$C = 2\pi 17.99$

$113.03\ in$

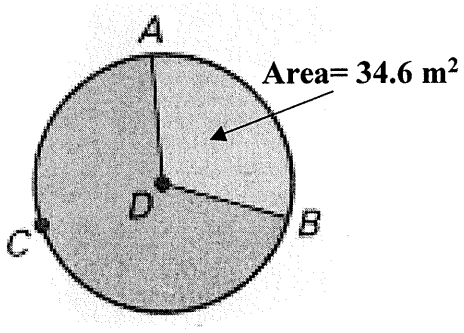
or $31.4 + 81.64 = 113.04\ in$

g.) Area of $\odot Q$

$A = \pi 17.99^2$

$A = 1016.75\ in^2$

10.) The area of $\odot D$ is 113.1 m^2. The area of sector ADB is 34.6 m^2. Find the indicated measure. Round to the measures to the nearest hundredth if necessary and label your answers.



Area of $\odot D$ is 113.1 m^2

a.) Radius of $\odot D$

$A = \pi r^2$

$\frac{113.1}{\pi} = \frac{\pi r^2}{\pi}$

$\sqrt{36} = \sqrt{r^2} \quad r = 6\ m$

b.) Circumference of $\odot D$

$C = 2\pi 6$

$C = 37.70\ m$

c.) $m\overset{\frown}{AB}$

$\frac{34.6}{113.1} = \frac{m\overset{\frown}{AB}}{360}$

$\frac{12456}{113.1} = \frac{113.1x}{113.1}$

$110.13° = m\overset{\frown}{AB}$

d.) Length of $\overset{\frown}{ACB}$

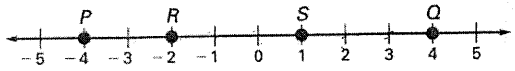
$360 - 110.13 = 249.87°$

$\frac{\text{length } \overset{\frown}{ACB}}{2\pi 6} = \frac{249.87}{360}$

$\frac{360x}{360} = \frac{9419.88}{360}$

$x = 26.17\ m$

11.) Find the probability that a point k, selected randomly on $\overline{PQ}$, is on the given segment. Express your answer as a fraction, decimal and percent.



$PQ = 8$

a) $\overline{RS}$ $P(RS) = \frac{3}{8}$

.375

37.5%

b) $\overline{PQ}$

$P(\overline{PQ}) = \frac{8}{8} = 1$

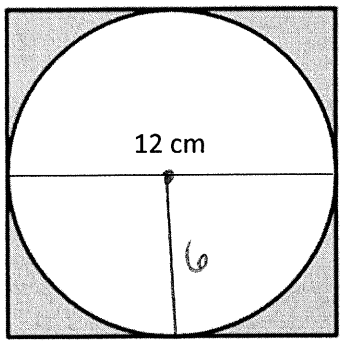
100%

c) $\overline{RQ}$ $P(\overline{RQ}) = \frac{6}{8} = \frac{3}{4}$

.75

75%

12.) Find the probability that a point chosen at random lies inside the square and outside the circle in the shaded region. (Round to the nearest hundredth if needed.)



$P(\text{shaded}) = \frac{A_\square - A_O}{A_\square} = \frac{12^2 - \pi 6^2}{12^2}$

$= \frac{144 - 36\pi}{144}$

$P(\text{shaded}) = .2146$

$= 21.46\%$

Chapter 12 $F + V = E + 2$

Use Euler's Theorem to find the value of *n*.

1.) Faces: 10
Vertices: 14
Edges: *n*

$10 + 14 = n + 2$
$-2 \quad -2$

$n = 22$

2.) Faces: 9
Vertices: *n*
Edges: 21

$9 + n = 21 + 2$
$-9 \quad -9$

$n = 14$

3.) Faces: *n*
Vertices: 18
Edges: 27

$n + 18 = 27 + 2$
$-18 \quad -18$

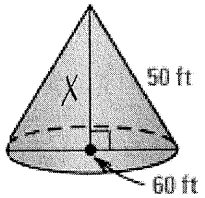
$n = 11$

For each of the following solids, provide the specific name, surface area, and volume. Round to the nearest hundredth and label your answers.

4.) Name: Cone

SA= 7539.82 ft²

V= 37699.11 ft³



$SA = \pi 30^2 + \pi 30(50)$

$V = \frac{1}{3}(\pi 30^2)(40)$

$r = 30$ ft

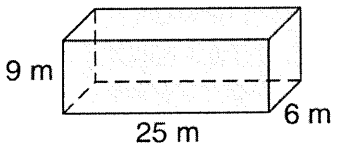
$x^2 + 30^2 = 50^2$
$-900 \quad -900$
$\sqrt{x^2} = \sqrt{1600}$

height $x = 40$

5.) Name: rectangular prism

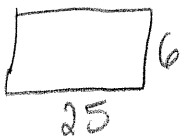
SA= 858 m²

V= 1350 m³



$V = (25 \cdot 6)(9)$

$SA = 2(150) + 62(9)$



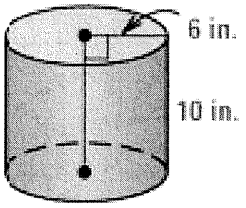
$B = 25 \cdot 6$
$B = 150$

$P = 25 + 25 + 6 + 6 = 62$

6.) Name: Cylinder

SA= $603.19\ in^2$

V= $1130.97\ in^3$



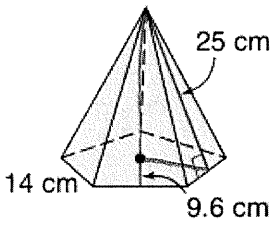
$SA = 2(\pi 6^2) + (2\pi 6)10$

$V = (\pi 6^2)10$

7.) Name: Pentagonal Pyramid

SA= $1211\ cm^2$

V= $2584.96\ cm^3$

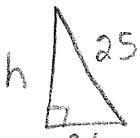


$B = \frac{9.6(70)}{2} = 336$

$SA = 336 + \frac{1}{2}(70)(25)$

$P = 14 \cdot 5 = 70$

$V = \frac{1}{3}(336)(23.08)$



$h^2 + 9.6^2 = 25^2$

$-9.6^2 \quad -9.6^2$

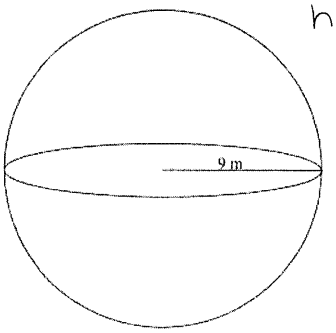
$\sqrt{h^2} = \sqrt{532.84}$

$h = 23.08$

8.) Name: Sphere

SA= $1017.88\ m^2$

V= $3053.63\ m^3$



$SA = 4\pi 9^2$

$V = \frac{4}{3}\pi 9^3$

9.) SA= $117.70\ in^2$

V= $89.13\ in^3$

$V_{tot} = V_{cube} + \frac{1}{2}V_{cyl}$

$= 4^3 + \frac{1}{2}(\pi 2^2)(4)$

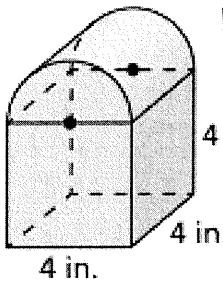
$V_{tot} = 64 + 8\pi$

$V_{tot} = 89.13$

$SA = \frac{1}{2}(SA_{cyl}) + SA_{cube} - B$ (2B + Ph − B)

$\frac{1}{2}(75.40) + B + Ph$

$SA_{tot} = 37.7 + 80 = 117.7$



$B = 4^2$

$P = 4(4) = 16$

$SA_{cyl} = 2(\pi 2^2) + (2\pi 2)(4)$

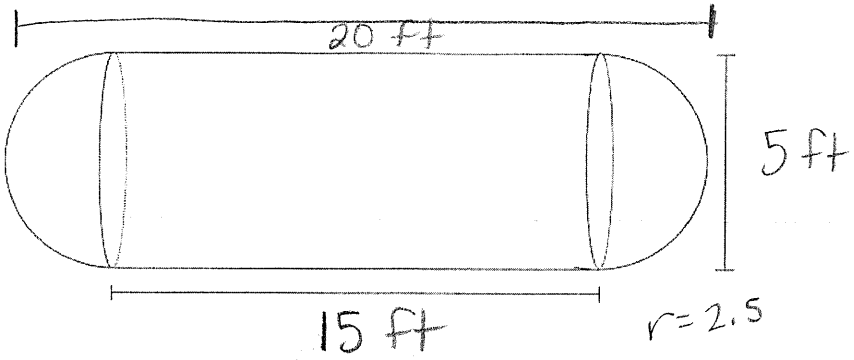
$= 75.40$

$SA_{cube} = 4^2 + 16(4)$

$= 16 + 64$

$SA_{cube} = 80$

10.) The liquid propane (LP) tank below is cylindrical in shape with a hemisphere on each end. The tank has an over all length of 20 feet and a diameter of 5 feet. Determine the volume and surface area of the tank.



$V_{tot} = V_{cyl} + V_{Sphere}$

$= (\pi 2.5^2)15 + \frac{4}{3}\pi 2.5^3$

$V_{tot} = 359.97\ ft^3$

$SA = Lat\ SA_{cyl} + SA_{sphere}$

$= 2\pi 2.5(15) + 4\pi 2.5^2$

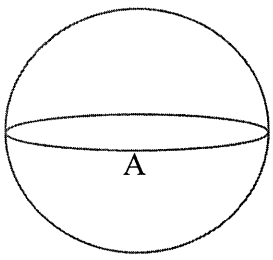
$SA = 314.16\ ft^2$

$Lat\ SA_{cyl} = \cancel{2B} + Ph$

11.) Fill in the chart

Ratio of perimeter/corresponding lengths (scale factor)	Ratio of Areas (surface area)	Ratio of Volumes
4:7	16:49	64:343
11:5	121:25	1331:125
3:4	9:16	$27\pi:64\pi = 27:64$

12.) Solid A (shown) is similar to Solid B (not shown) with the given scale factor of A to B. Find the surface area and volume of Solid B.



A:B

Scale factor of 3:2

$SA = 324\pi\ in^2$

$V = 972\pi\ in^3$

ROSA

$\frac{3^2}{2^2} = \frac{9}{4}$

$\frac{9}{4} = \frac{324\pi}{SA_B}$

$\frac{9x}{9} = \frac{4071.50}{9}$

$SA_B = 452.39\ in^2$

ROV

$\frac{3^3}{2^3} = \frac{27}{8}$

$\frac{27}{8} = \frac{972\pi}{V_B}$

$\frac{27V}{27} = \frac{24429.02}{27}$

$V_B = 904.78\ in^3$