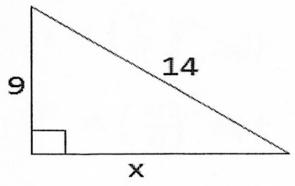
Geometry
Semester 2 Review
Chapter 7

Name: _____

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

a)



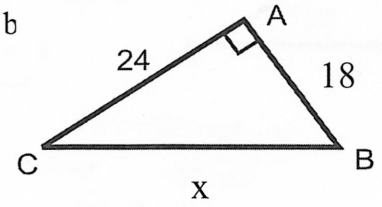
$x^2 + 9^2 = 14^2$

$x^2 + 81 = 196$

$\sqrt{x^2} = \sqrt{115}$

$x = 10.72$ units

b



$24^2 + 18^2 = x^2$

$576 + 324 = x^2$

$\sqrt{900} = \sqrt{x^2}$

$x = 30$ units

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

a) 21, 20, 28 → $21^2 + 20^2 = 28^2$

$841 = 784$

Acute Triangle

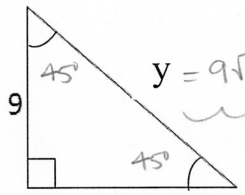
b) 14, 50, 40 → $14^2 + 40^2 = 50^2$

$1796 = 2500$

Obtuse Triangle

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

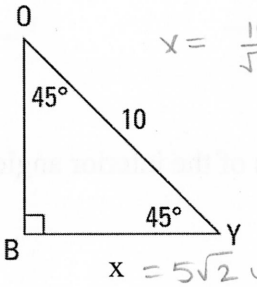
a)



$y = 9\sqrt{2}$ units

$x = 9$ units

b)



$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{4}}$

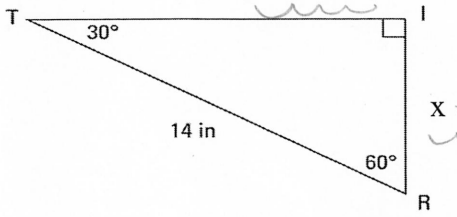
$= \frac{10\sqrt{2}}{2}$

$= 5\sqrt{2}$

$5\sqrt{2} = y$

$x = 5\sqrt{2}$ units

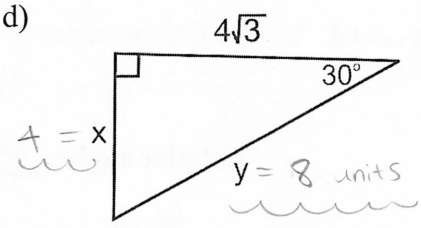
c)



$y = 7\sqrt{3}$ in

$x = 7$ in

d)

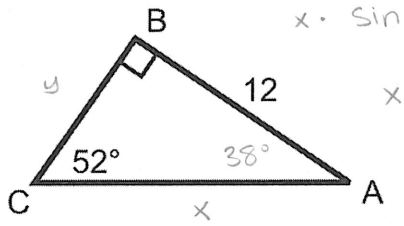


$x = \frac{4\sqrt{3}}{\sqrt{3}}$

$x = 4$

4.) Solve each right triangle.

a)



$x \cdot \sin 52° = \frac{12}{x} \cdot x$

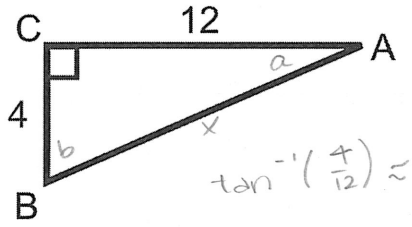
$\frac{x \cdot \sin 52}{\sin 52} = \frac{12}{\sin 52}$

$x = 15.23$ units

$y \cdot \tan 52° = \frac{12}{y} \cdot y \rightarrow \frac{y \cdot \tan 52°}{\tan 52°} = \frac{12}{\tan 52°}$

$y = 9.38$ units

b)



$4^2 + 12^2 = x^2$

$x^2 = 160$

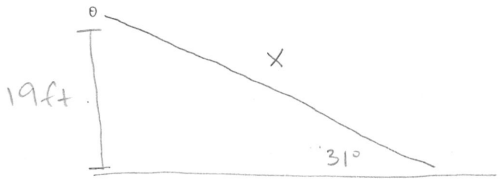
$\tan^{-1}\left(\frac{4}{12}\right) \approx 18.4° = m\angle A$

$\tan^{-1}\left(\frac{12}{4}\right) \approx 71.6° = m\angle B$

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

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?



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

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

$x = 36.89$ ft

Chapter 8

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

$(18-2)180$

$= 2880°$

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.

should be supplementary

Interior angle: 165° Exterior angle: 15°

$\frac{(24-2)180}{24}$

$= 165°$

$\frac{360°}{24} = 15°$

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°

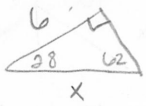
b.) $m\angle QPR$ = 28°

c.) $m\angle PSR$ = 124°

d.) TP = 6 ft

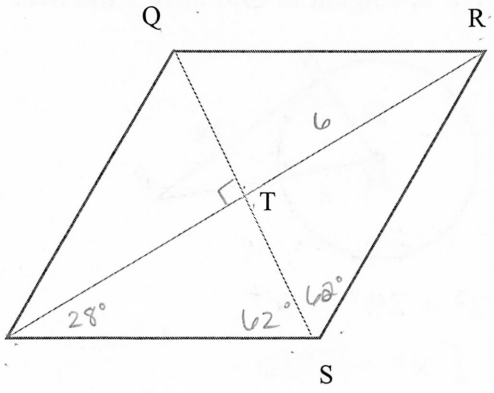
e.) PR = 12 ft

f.) PS



$\sin 62° = \frac{6}{x}$

$x = 6.8$ ft



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°

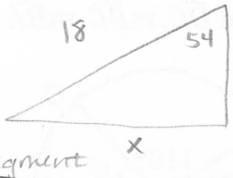
b.) $m\angle WPX$ = 180 − 36 − 36 = 108°

c.) $m\angle XPY$ = 180 − 108 = 72°

d.) PZ = 9 in

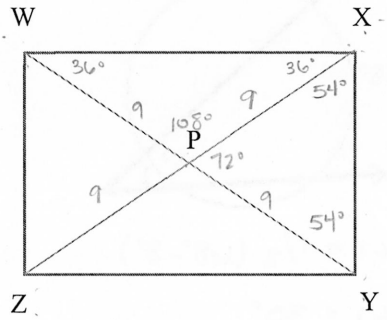
e.) PY = 9 in

f.) YZ



$\sin 54° = \frac{x}{18}$

$x = 14.56$ in

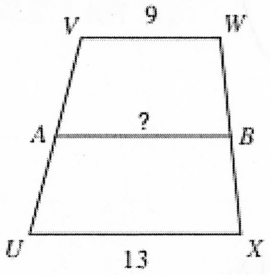


6.) Find the length of them median of trapezoid UVWX

the midsegment

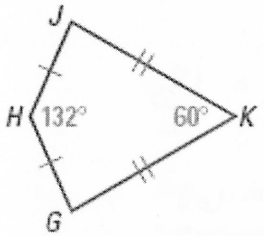
AB= 11 units

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



7.) Find $m\angle J$ = 84°

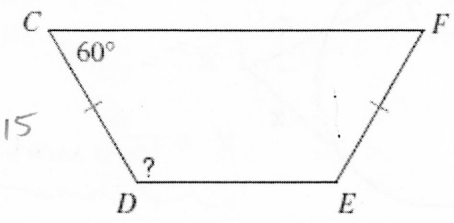
360° − 132 − 60 = 2x



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

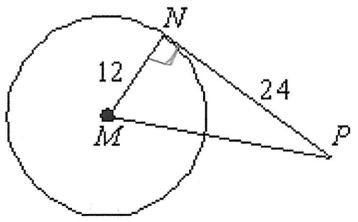
$m\angle F$ = 60° $m\angle D$ = 120°

$m\angle E$ = 120° EF = 15 cm



Chapter 10

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

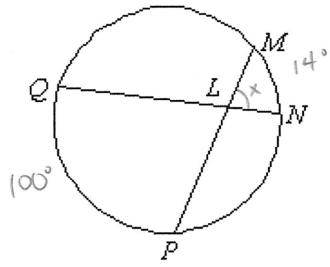


$12^2 + 24^2 = x^2$

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

$x = 26.83$ units

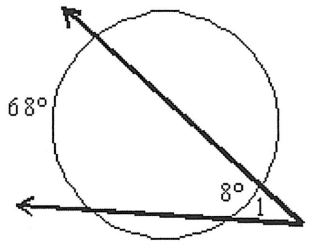
2.) Given: $m\widehat{MN} = 14°$ and $m\widehat{QP} = 100°$. Find $m\angle QLP$.



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

$x = 57°$

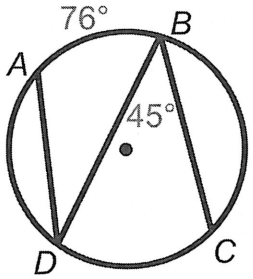
3.) Find the measure of $\angle 1$



$m\angle 1 = \frac{1}{2}(68° - 8°)$

$m\angle 1 = 30°$

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



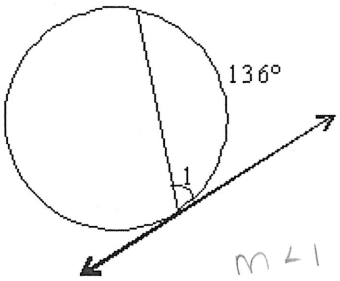
$m\angle ADB = \frac{76}{2}$

$m\angle ADB = 38°$

$m\widehat{DC} = 2(45°)$

$m\widehat{DC} = 90°$

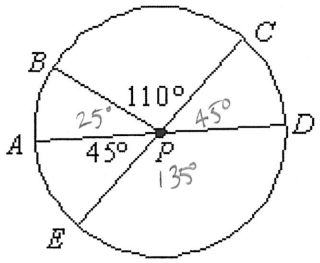
5.) Find the measure of $\angle 1$



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

$m\angle 1 = 68°$

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

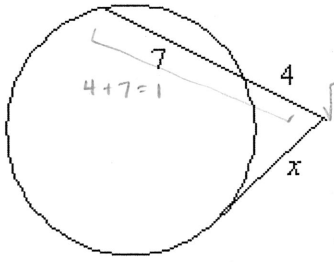


$m\widehat{DC} = 45°$

$m\widehat{BC} = 110°$

$m\widehat{BA} = 25°$

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

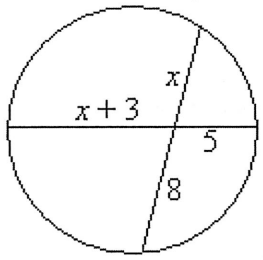


$x^2 = 4(11)$

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

$x = 6.6$ units

8.) Find the value of x.



$8 \cdot x = 5(x+3)$

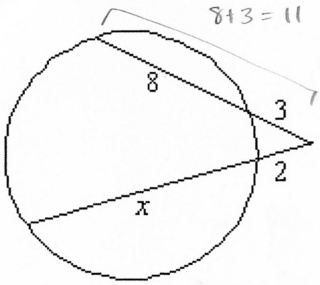
$8x = 5x + 15$

$-5x \quad -5x$

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

$x = 5$ units

9.) Find the value of x.



$3(11) = 2(x+2)$

$33 = 2x + 4$

$-4 \quad -4$

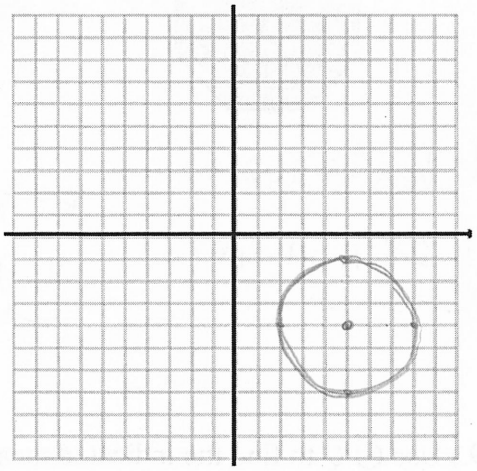
$\frac{29}{2} = \frac{2x}{2}$ $x = 14.5$ units

10.) Graph the equation.

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

Center: $(5, -4)$

$r = 3$



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

Center: $(-6, 3)$ Radius: 7

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

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

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

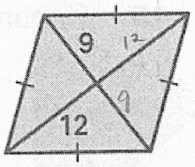
b) Center (-3, 6), Radius 1.4

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

Chapter 11

Find the area of the figure- label your answers.

1.)



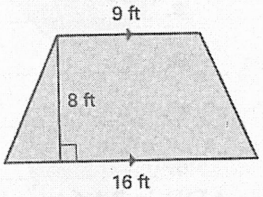
$d_1 = 18$

$d_2 = 24$

$A = \frac{18 \cdot 24}{2}$

$A = 216 \text{ units}^2$

2.)



$b_1 = 9$

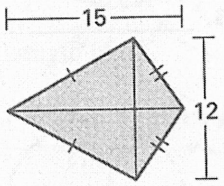
$b_2 = 16$

$h = 8$

$A = \frac{1}{2} \cdot 8(9+16)$

$A = 100 \text{ units}^2$

3.)



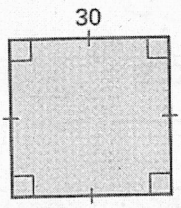
$d_1 = 15$

$d_2 = 12$

$A = \frac{15 \cdot 12}{2}$

$A = 90 \text{ units}^2$

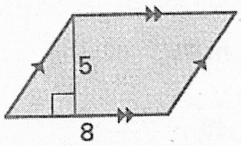
4.)



$A = 30^2$

$A = 900 \text{ units}^2$

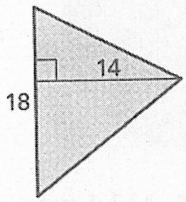
5.)



$A = 8 \cdot 5$

$A = 40 \text{ units}^2$

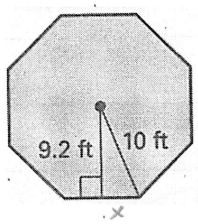
6.)



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

$A = 126 \text{ units}^2$

7.)



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

$x^2 = 15.36$

$x = 3.9$ $\quad S = 2(3.9)$

$S = 7.8$

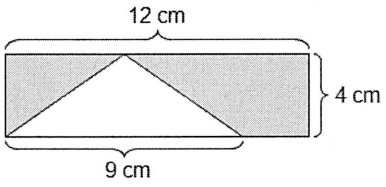
$P = 7.8(8)$

$P = 62.4\text{ ft}$

$A = \frac{1}{2}(9.2)(62.4)$

$A = 287.04\text{ ft}^2$

8.) Area of the shaded region

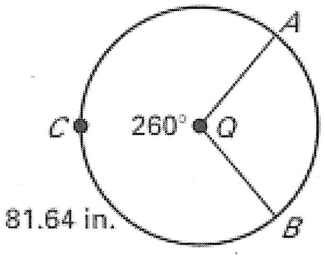


Total Area $= 12 \cdot 4 = 48\text{ cm}^2$

Non Shaded Area $= \frac{9 \cdot 4}{2} = 18\text{ cm}^2$

Shaded Area $= 48 - 18 = 30\text{cm}^2$

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 $\overset{\frown}{ACB} = 81.64\text{ in}$

c.) Radius of $\odot Q$ $r = 17.99$

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

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

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

$= 100°$

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

$\frac{\overset{\frown}{AB}}{2\pi \cdot 17.99} = \frac{100°}{360°}(2\pi \cdot 17.99)$

Arc Length $\overset{\frown}{AB} = 31.4\text{ in}$

f.) Circumference of $\odot Q$

$C = 2\pi \cdot 17.99$

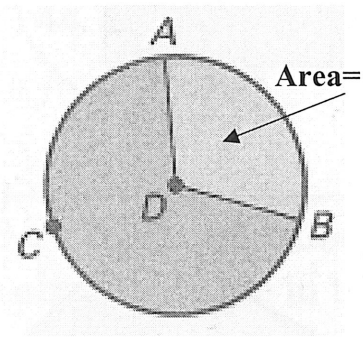
$C = 113.03\text{in}$

g.) Area of $\odot Q$

$A = \pi \cdot 17.99^2$

$A = 1016.75\text{in}^2$

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 $\odot D$

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

$r = 6\text{m}$

b.) Circumference of $\odot D$

$C = 2\pi \cdot 6$

$C = 37.7\text{ m}$

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

$\frac{34.6}{\pi \cdot 6^2} = \frac{m\overset{\frown}{AB}}{360°}$

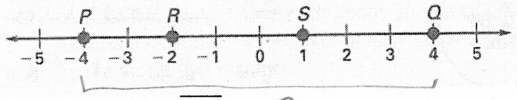
$\frac{12456}{36\pi} = \frac{36\pi (m\overset{\frown}{AB})}{36\pi}$

$m\overset{\frown}{AB} = 110.14°$

d.) Length of $\overset{\frown}{ACB} = \frac{249.86°}{360°}(2\pi 6)$

Length of $\overset{\frown}{ACB} = 26.17\text{m}$

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) $\overline{RS} = \frac{3}{8}$

$= 0.375$

$= 37.5\%$

b) $\overline{PQ} = \frac{8}{8}$

$= 1$

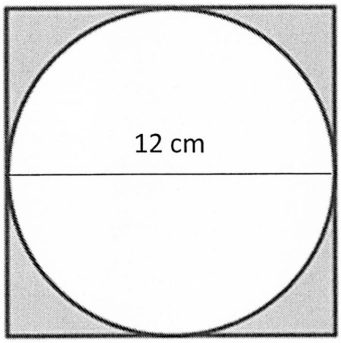
$= 100\%$

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

$= 0.75$

$= 75\%$

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.)



Total Area $= 12(12) = 144\ cm^2$

Unshaded Area $= \pi \cdot 6^2 = 36\pi\ cm^2$

Shaded Area $= 144 - 36\pi$

$P(\text{Pt lies in shaded area}) = \frac{144 - 36\pi}{144} = 0.2146 \rightarrow 21.46\%$

Chapter 12

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

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

$10 + 14 = n + 2$

$24 = n + 2$

$-2 \quad -2$

$22 = n$

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

$9 + n = 21 + 2$

$9 + n = 23$

$-9 \quad -9$

$n = 14$

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

$n + 18 = 27 + 2$

$n + 18 = 29$

$-18 \quad -18$

$n = 11$

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

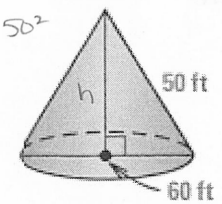
4.) Name: Cone

SA= 7,539.82 ft²

V= 37,699.11 ft³

$r^2 + 30^2 = 50^2$

$r = 40$



$r = 30$

$SA = \pi \cdot 30^2 + \frac{1}{2}(2\pi \cdot 30)50$

$SA = 900\pi + 1500\pi$

$SA = 7539.82\ ft^2$

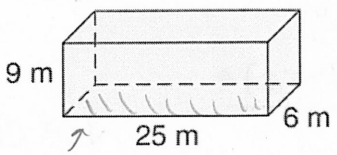
$V = \frac{1}{3}(\pi \cdot 30^2)40$

$V = 37699.11\ ft^3$

5.) Name: Rectangular Prism

SA= 858 m²

V= 1350 m³



Base

$B = 25 \cdot 6$

$B = 150$

$P = 25 + 6 + 25 + 6$

$P = 62$

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

$SA = 858\ m^2$

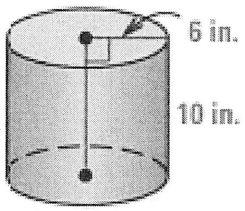
$V = 150 \cdot 9$

$V = 1350\ m^3$

6.) Name: Cylinder

SA= 603.19 in^2

V= 1130.97 in^3



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

$SA = 72\pi + 120\pi$

$SA = 603.19\ in^2$

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

$V = 1130.97\ in^3$

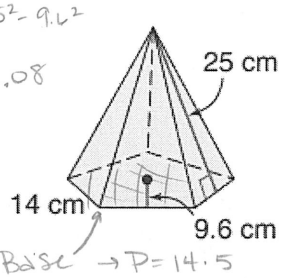
7.) Name: Pentagonal Pyramid

SA= 1211 cm^2

V= 2584.96 cm^3

$h^2 = 25^2 - 9.6^2$

$h = 23.08$



Base → P = 14.5

$B = \frac{1}{2}(9.6)(70)$

$B = 336\ cm^2$

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

$SA = 1211$

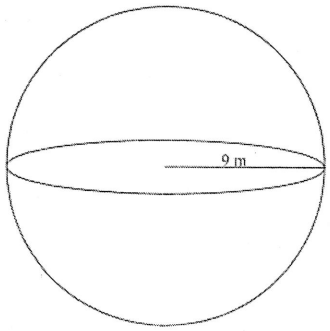
$V = \frac{1}{3}(336)(23.08)$

$V = 2584.96\ cm^3$

8.) Name: Sphere

SA= 1017.88 m^2

V= 3053.63 m^3



$SA = 4\pi \cdot 9^2$

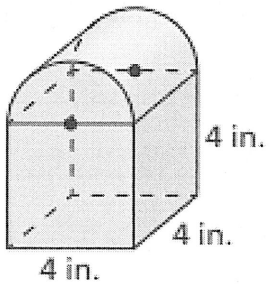
$SA = 1077.88\ m^2$

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

$V = 3053.63\ m^3$

9.) SA= 117.70 in^2

V= 89.13 in^3



SA of Cube = $4(4) = 16(5)$ ← 1 side cannot be touched

$= 80\ in^2$

SA of $\frac{1}{2}$ Cylinder = $\frac{2(\pi \cdot 2^2) + (2\pi \cdot 2)4}{2}$

$= 37.70\ in^2$

Total SA = 80 + 37.7

SA = 117.70 in^2

V of Cube = 4^3

$= 64\ in^3$

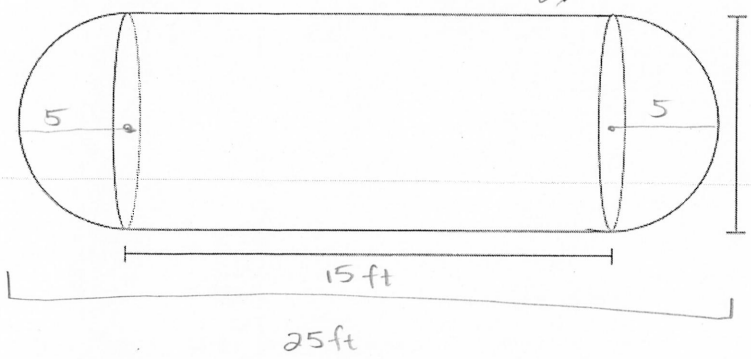
V of $\frac{1}{2}$ Cylinder = $\frac{(\pi \cdot 2^2)4}{2}$

$= 25.13\ in^3$

Total Volume = 64 + 25.13

V = 89.13 in^3

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.



SA of Cylinder $= 2(\pi \cdot 2.5^2) + (2\pi \cdot 2.5)15$

$= 75\pi \text{ ft}^2$

SA of Sphere $= 4\pi \cdot 2.5^2$

$= 25\pi \text{ ft}^2$

Total SA $= 75\pi + 25\pi$

SA $= 314.16 \text{ ft}^2$

V of Cylinder $= (\pi \cdot 2.5^2)15$

$= 294.52 \text{ ft}^3$

V of Sphere $= \frac{4}{3}\pi \cdot (2.5)^3$

$= 65.45$

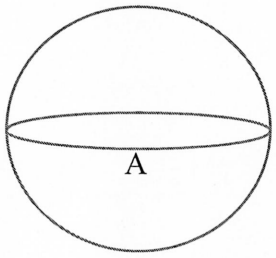
Total V $= 294.52 + 65.45$

V $= 359.97 \text{ ft}^3$

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 π:64 π

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.



Scale factor of 3:2
SA= 324 π in^2
V= 972 π in^3

Area Ratio $= \frac{3^2}{2^2} \rightarrow \frac{9}{4} = \frac{324\pi}{B}$

$\frac{9B}{9} = \frac{1296\pi}{9}$

$B = 144\pi \text{ in}^2$ OR $B = 452.39 \text{ in}^2$ — Surface Area

Volume Ratio $= \frac{3^3}{2^3} \rightarrow \frac{27}{8} = \frac{972\pi}{B}$

$\frac{27B}{27} = \frac{7776\pi}{27}$

Volume: $B = 288\pi \text{ in}^3$ OR $B = 904.78 \text{ in}^3$