# Geometry – Worksheet

## Sec. 10.4, 10.6 – Area and Volume of Prisms and Cylinders

**Name:**

**Period:** 1 2 6 8 **Date:** 4/18/17

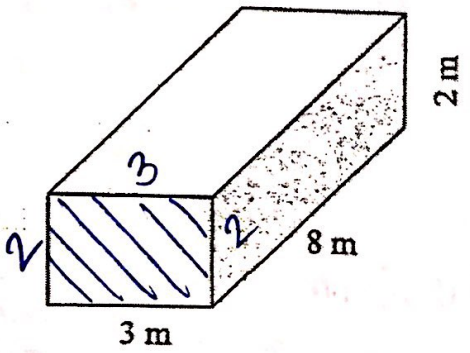
Section 1 – Identify the perimeter/circumference of the base, the area of the base, and the height for each prism or cylinder. Then calculate the Lateral Area (LA), Total Surface Area (TA), and Volume (V) for each figure. Use appropriate answers and leave answers in terms of $\pi$ where appropriate.

1) $P_B =$ 10 m  LA = 10X8=80m²

$A_B =$ 6m²  TA = 80+2(6)= 92m²

h = 8m  V = 6X8=48m³

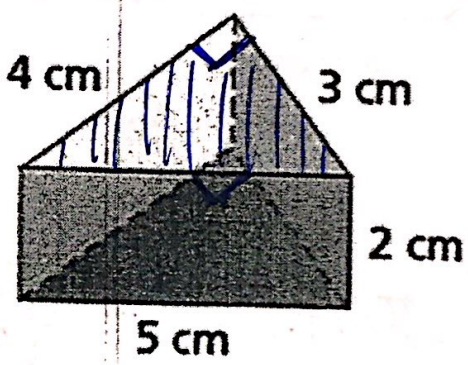
answers may vary




2) $P_B =$ 12cm  LA = 12X2=24m²

$A_B =$ $\frac{3X4}{2}$ = 6cm²  TA = 24+2(6)= 36cm²

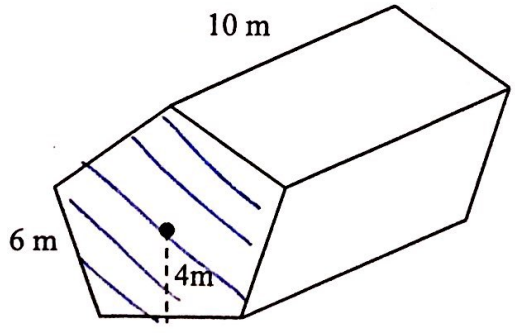
h = 2cm  V = 6X2=12m³




3) $P_B =$ 6X5= 30m  LA = 30mX10m= 300m²

$A_B =$ $\frac{1}{2}$(4)(30)= 60m²  TA = 300+2(60)= 420m²

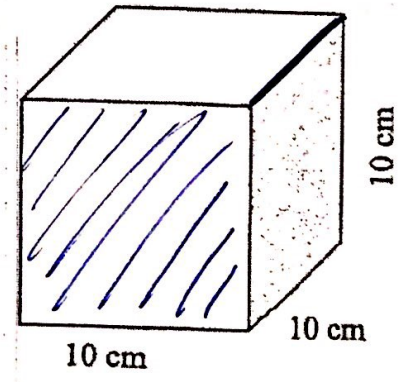
h = 10m  V = 60m²X10m= 600m³




4) $P_B =$ 40cm  LA = 400cm²

$A_B =$ 100cm²  TA = 400+2(100)= 600cm²

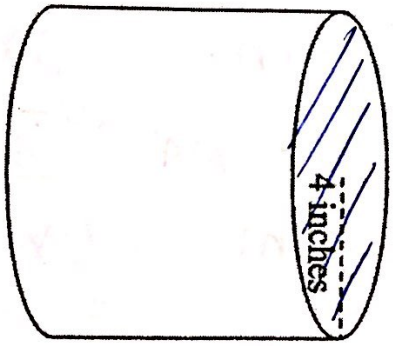
h = 10  V = 1,000 cm³



5) $P_B =$ $2\pi r$ $8\pi$ in $LA =$ $8\pi \times 6 = 48\pi$ in$^2$

$A_B =$ $\pi r^2$ $16\pi$ in$^2$ $TA =$ $48\pi + 2(16\pi) =$ $80\pi$ in$^2$

$h =$ 6 in. $V =$ $96\pi$ in$^3$

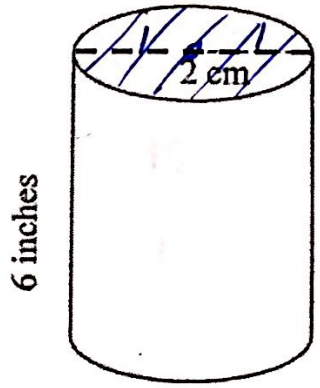



6 inches

6) $P_B =$ $2\pi r$ $2\pi$ in $LA =$ $2\pi \times 6 = 12\pi$ in.$^2$

$A_B =$ $\pi r^2$ $\pi$ in$^2$ $TA =$ $12\pi + 2(\pi) =$ $14\pi$ in$^2$

$h =$ 6 in $V =$ $6\pi$ in$^3$

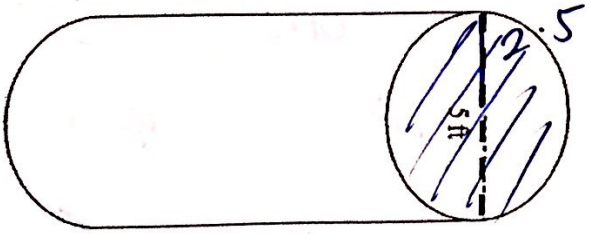



7) $P_B =$ $2\pi r$ $5\pi$ ft. $LA =$ $5\pi \times 17 = 85\pi$ ft$^2$

$A_B =$ $\pi r^2$ $6.25\pi$ ft$^2$ $TA =$ $85\pi + 2(6.25\pi) =$ $97.5\pi$ ft$^2$

$h =$ 17 ft. $V =$ $17(6.25\pi) =$ $106.25\pi$ ft$^3$

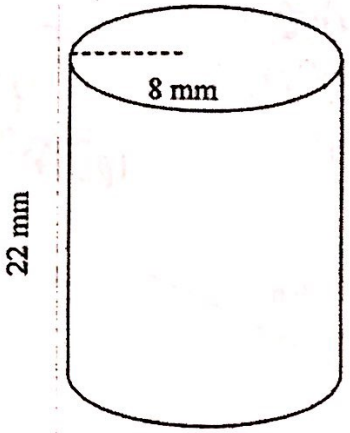
17 ft




8) $P_B =$ $2\pi r$ $16\pi$ mm $LA =$ $16\pi(22) =$ $352\pi$ mm$^2$

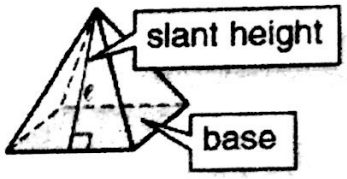
$A_B =$ $\pi r2$ $64\pi$ mm$^2$ $TA =$ $A + 2(64\pi) =$ $480\pi$ mm$^2$

$h =$ 22mm $V =$ $64\pi \times 22 =$ $1408\pi$ mm$^3$



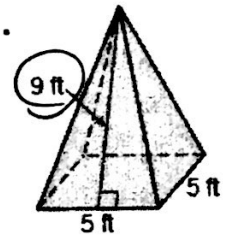
**Geometry – Worksheet** **Name:** Ima Key

**Sec. 10.5, 10.7** **Period:** (1) 2 6 8 **Date:** 4/19/17

| Lateral and Surface Area of a Regular Pyramid | | |
|---|---|---|
| **Lateral Area** | The lateral area of a regular pyramid with perimeter $P$ and slant height $\ell$ is $L = \frac{1}{2}P\ell$. |   |
| **Surface Area** | The surface area of a regular pyramid with lateral area $L$ and base area $B$ is $S = L + B$, or $S = \frac{1}{2}P\ell + B$. | |

**Find the lateral area and surface area of each regular pyramid. Round to the nearest tenth.**

**1.**




$sh = 9$

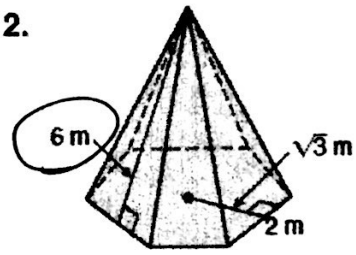
$PB = 4 \cdot 5 = 20$

$AB = 5^2 = 25$

$LA = \frac{1}{2} \cdot 20 \cdot 9 = 90\ ft^2$

$TA = 90 + 25 = 115\ ft^2$

**2.**




$sh = 6$

$PB = 6 \cdot 2 = 12$

$AB = \frac{1}{2} \cdot 12 \cdot \sqrt{3}$

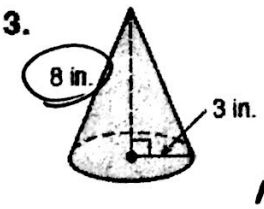
$= 6\sqrt{3}$

$LA = \frac{1}{2} \cdot 12 \cdot 6 = 36\ m^2$

$TA = 36 + 6\sqrt{3} = 46.4\ m^2$

**Find the lateral area and surface area of each right cone. Give your answers in terms of $\pi$.**

**3.**




$sh = 8$

$CB = 2 \cdot 3 \cdot \pi$

$= 6\pi$

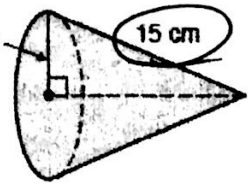
$AB = 3^2\pi$

$= 9\pi$

$LA = \frac{1}{2} \cdot 6\pi \cdot 8 = 24\pi = 75.4\ in^2$

$TA = 24\pi + 9\pi = 33\pi = 103.7\ in^2$

**4.**




$sh = 15$

$CB = 2 \cdot 6 \cdot \pi$

$= 12\pi$

$AB = 6^2\pi$

$= 36\pi$

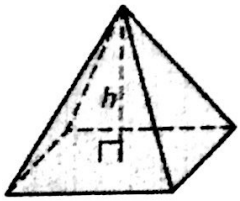
$LA = \frac{1}{2} \cdot 12\pi \cdot 15 = 90\pi = 282.7\ cm^2$

$TA = 90\pi + 36\pi = 126\pi = 395.8\ cm^2$

## Volume of a Pyramid

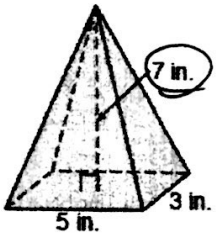
The volume of a pyramid with base area $B$ and height $h$ is

$$V = \frac{1}{3}Bh.$$




**Find the volume of each pyramid. Round to the nearest tenth if necessary.**

1.

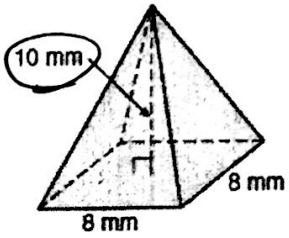



$h = 7$

$A_B = 5 \cdot 3 = 15$

$V = \frac{1}{3} \cdot 15 \cdot 7 = 35 \text{ in}^3$

2.



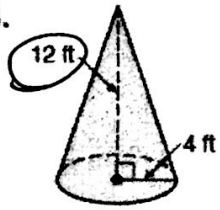

$h = 10$

$A_B = 8^2 = 64$

$V = \frac{1}{3} \cdot 64 \cdot 10 = 213.3 \text{ mm}^3$

**Find the volume of each cone. Give your answers both in terms of $\pi$ and rounded to the nearest tenth.**

3.

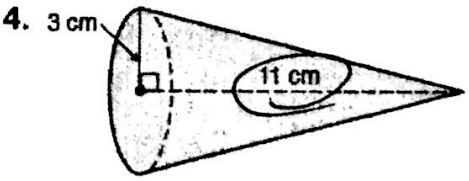



$h = 12$

$A_B = 4^2\pi = 16\pi$

$V = \frac{1}{3} \cdot 16\pi \cdot 12 = 64\pi = 201.1 \text{ ft}^3$

4.

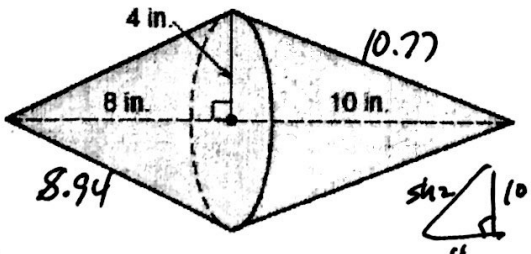



$h = 11$

$A_B = 3^2\pi = 9\pi$

$V = \frac{1}{3} \cdot 9\pi \cdot 11 = 33\pi = 103.7 \text{ cm}^3$

**Find the surface area and volume of the figure. Leave your answers in terms of pi.**




Left cone

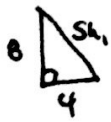
$V = \frac{1}{3} \cdot 4^2\pi \cdot 8 = 42.\overline{6}\pi$

$LA = \frac{1}{2} \cdot 2.4 \cdot \pi \cdot 8.94 = 35.76\pi$

Right cone

$V = \frac{1}{3} \cdot 4^2 \cdot 10 = 53.3\pi$

$LA = \frac{1}{2} \cdot 2.4 \cdot \pi \cdot 10.77 = 43.08\pi$




$Sh_1^2 = 8^2 + 4^2 = 64 + 16$

$Sh_1 = \sqrt{80} = 8.94$

$Sh_2^2 = 10^2 + 4^2 = 100 + 16$

$Sh_2 = \sqrt{116} = 10.77$

$SA = 35.76\pi + 43.08\pi = 78.84\pi = 247.7 \text{ in}^2$

$V = 42.\overline{6}\pi + 53.\overline{3}\pi = 96\pi = 301.6 \text{ in}^3$