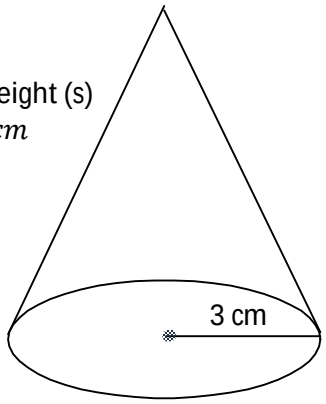
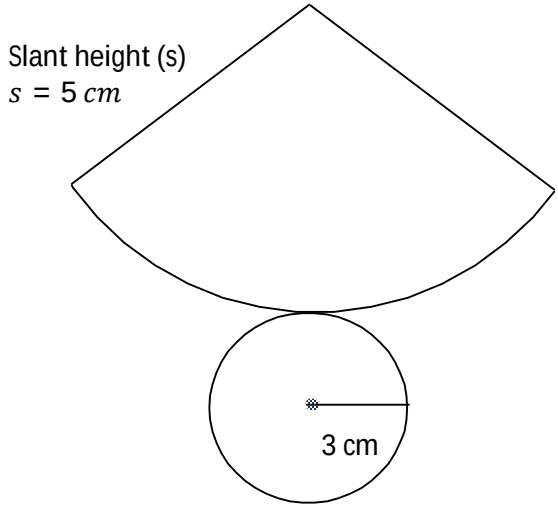
M10 - 2.2 - Cone/Square Pyramid Surface Area Notes

Cone

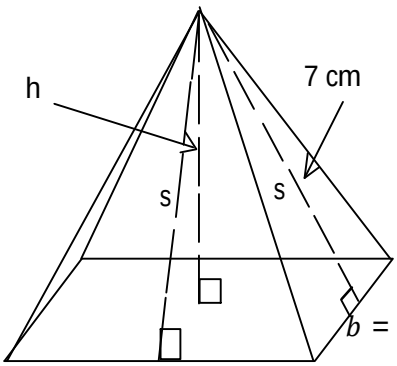


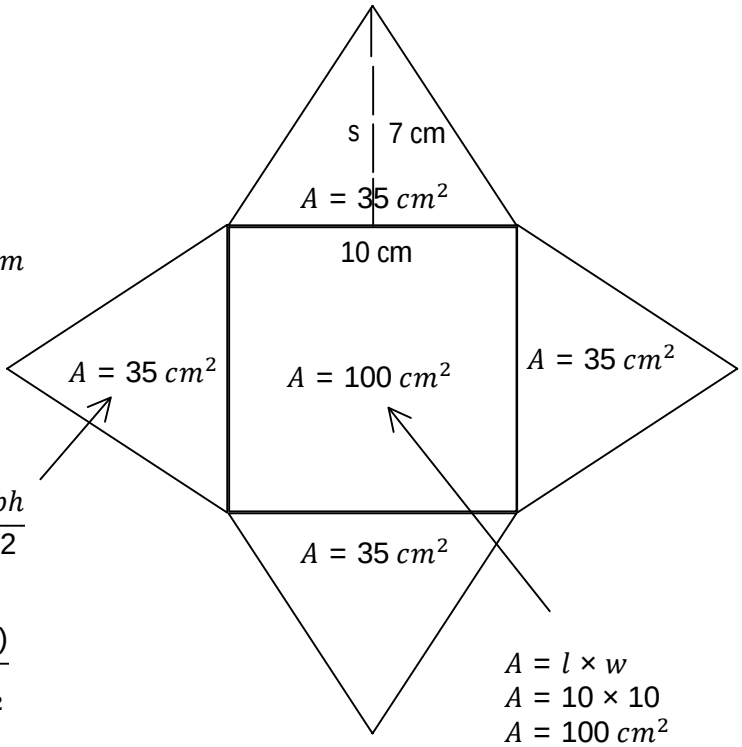
Net Area



$SA = \pi r^2 + \pi rs$
$SA = (3.14)(3)^2 + (3.14)(3)(5)$
$SA = 28.27 + 47.12$
$SA = 75.40\ cm^2$

Square Based Pyramid





Method 1

$SA = 35 + 35 + 35 + 35 + 100$
$SA = 240\ cm^2$

Method 2

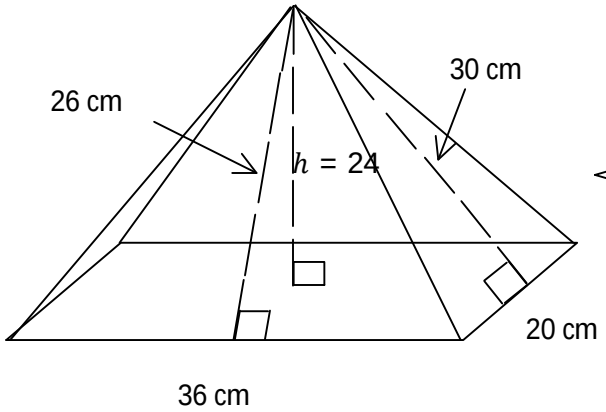
$SA = 2bs + b^2$
$SA = 2(10)(7) + (10)^2$
$SA = 140 + 100$
$SA = 240\ cm^2$

$A = \frac{bh}{2}$

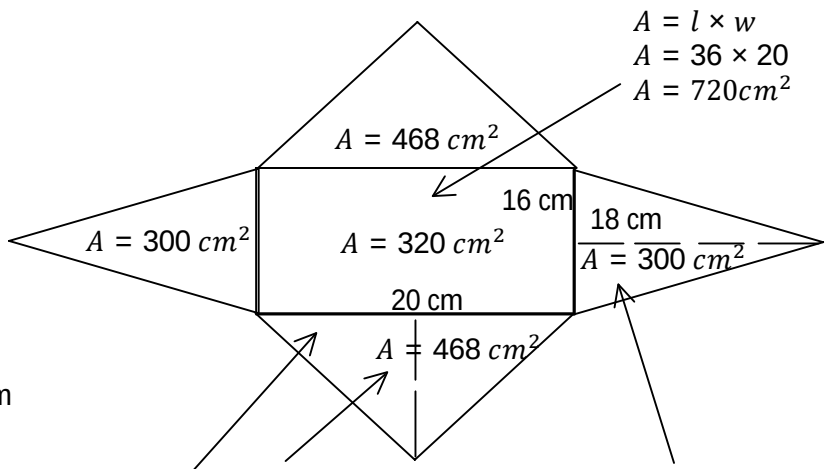
$A = \frac{(10)(7)}{2}$
$A = 35\ cm^2$

$A = l \times w$
$A = 10 \times 10$
$A = 100\ cm^2$

M10 - 2.2 - Rectangular Pyramid/Sphere Surface Area Notes



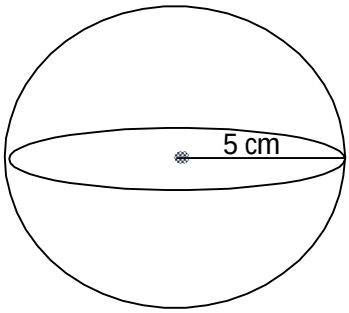
SA = 300 + 300 + 468 + 468 + 720
SA = 600 + 936 + 720
SA = 2256 cm^2



$A = \frac{bh}{2}$
$A = \frac{(36)(26)}{2}$
A = 468 cm^2

$A = \frac{bh}{2}$
$A = \frac{(20)(30)}{2}$
A = 300 cm^2

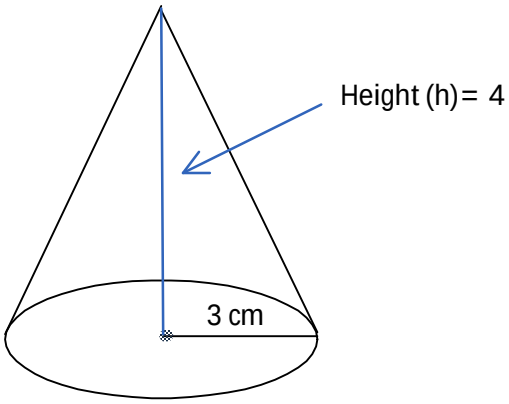
Sphere



$SA = 4\pi r^2$
$SA = 4(3.14)(5)^2$
SA = 314 cm^2

M10 - 2.2 - Surface Area of Cone Pythagoras Notes

Cone



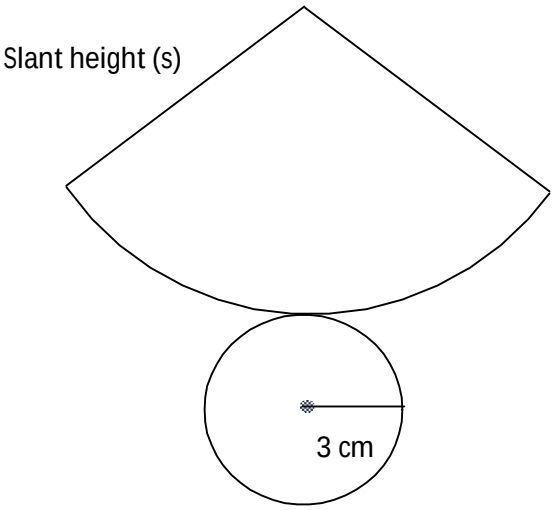
$SA = \pi r^2 + \pi rs$

$r = 3$
s =?

$c^2 = a^2 + b^2$
$s^2 = 3^2 + 4^2$
$s^2 = 9 + 16$
$s^2 = 25$
$s = \sqrt{25}$
$s = 5$

$r = 3$
$s = 5$

Net Area

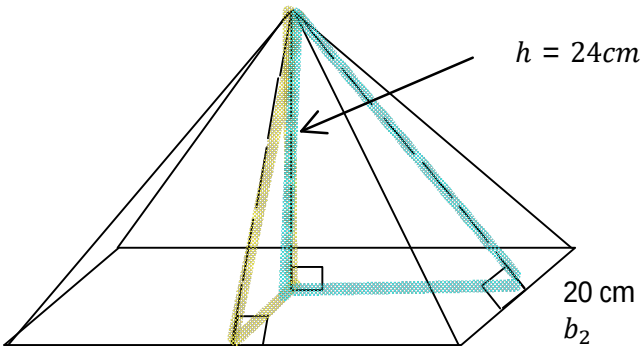


Step 2: Determine the Surface Area of the Cone.

$SA = \pi r^2 + \pi rs$
$SA = \pi(3)^2 + \pi(3)(5)$
$SA = 9\pi + 15\pi$

$\boxed{SA = 24\pi\ cm^2}$

M10 - 2.2 - Surface Area of a Rectangular Pyramid Pythagoras Notes



$SA = Area\ of\ Triangles + Area\ of\ Base$

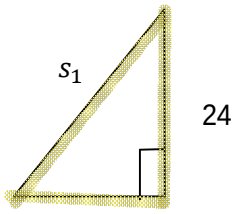
$SA = 2 \times \frac{b_1 s_1}{2} + 2 \times \frac{b_2 s_2}{2} + b_1 b_2$

$SA = b_1 s_1 + b_2 s_2 + b_1 b_2$

$b_1 = 36$
$s_1 = ?$

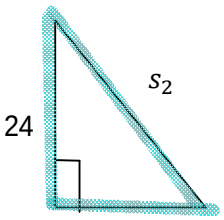
$b_2 = 20$
$s_2 = ?$

Step 1: Solve for s_1 using the Pythagorean Thm:



$(s_1)^2 = 10^2 + 24^2$
$(s_1)^2 = 676$
$s_1 = 26$

Step 2: Solve for s_2 using the Pythagorean Thm:

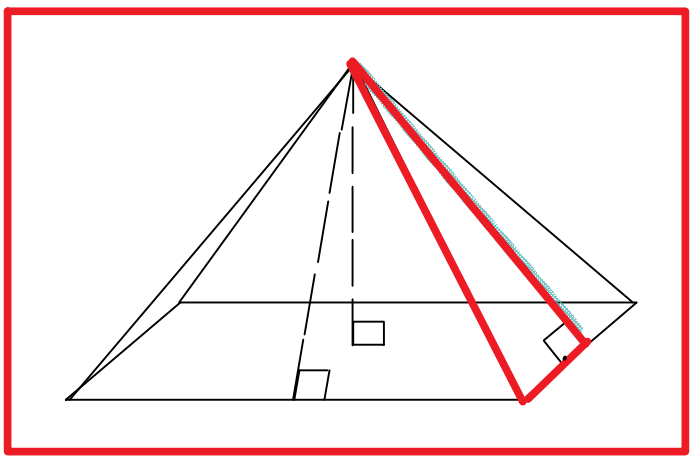


$(s_2)^2 = 18^2 + 24^2$
$(s_2)^2 = 900$
$s_2 = 30$

Step 3: Find the Surface Area

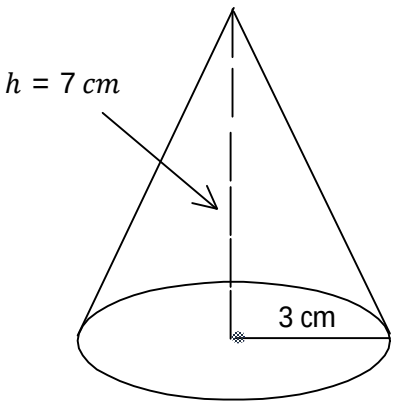
$SA = b_1 s_1 + b_2 s_2 + b_1 b_2$
$SA = (36)(26) + (20)(30) + (36)(20)$

$\boxed{SA = 2256cm^2}$



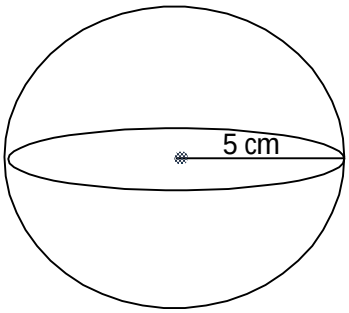
M10 - 2.3 - Cone/Sphere Volume Notes

Cone



$$V = \frac{1}{3} \times (area\ of\ base) \times h$$
$$V = \frac{1}{3} \times (\pi r^2) \times h$$
$$V = \frac{1}{3} \times \left((3.14)(3)^2\right) \times 7$$
$$V = 66.0\ cm^3$$

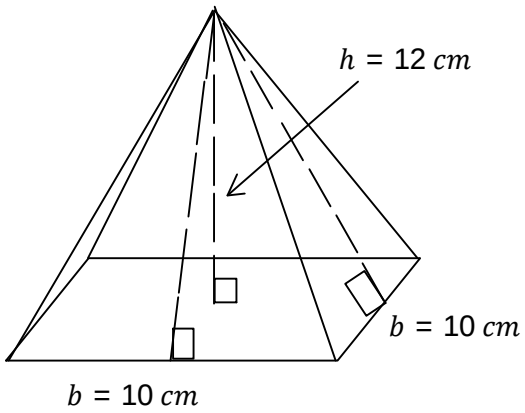
Sphere



$$V = \frac{4}{3}\pi r^3$$
$$V = \frac{4}{3}(3.14)(5)^3$$
$$V = 523.6\ cm^3$$

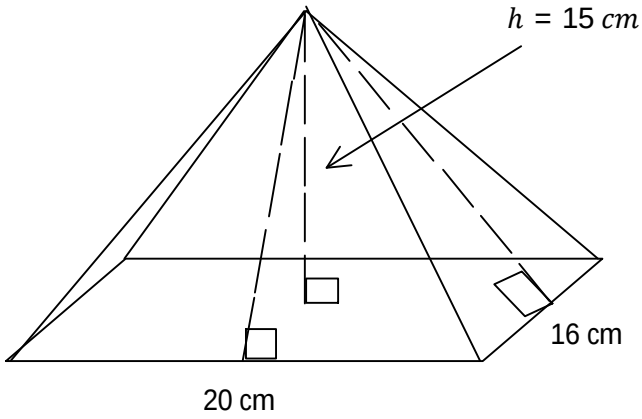
M10 - 2.3 - Pyramid Volume Notes

Square Based Pyramid



$$V = \frac{1}{3} \times (area\ of\ base) \times h$$
$$V = \frac{1}{3} \times (l \times w) \times h$$
$$V = \frac{1}{3} \times (10 \times 10) \times 12$$
$$V = 400\ cm^3$$

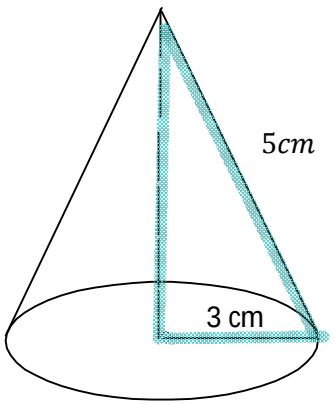
Rectangular Based Pyramid



$$V = \frac{1}{3} \times (area\ of\ base) \times h$$
$$V = \frac{1}{3} \times (l \times w) \times h$$
$$V = \frac{1}{3} \times (20 \times 16) \times 15$$
$$V = 1600\ cm^3$$

M10 - 2.3 - Cone Volume Pythagoras Notes

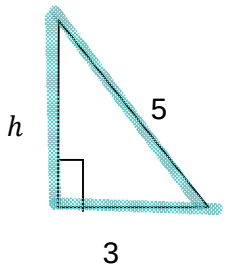
Cone



$$V = \frac{1}{3} \times (area\ of\ base) \times h$$
$$V = \frac{1}{3} \times (\pi r^2) \times h$$

$r = 3$
h =?

Step 1: Find h using the Pythagorean Thm.



$$5^2 = 3^2 + h^2$$
$$5^2 - 3^2 = h^2$$
$$h^2 = 5^2 - 3^2$$
$$h^2 = 16$$
$$h = \sqrt{16}$$
$$h = 4$$

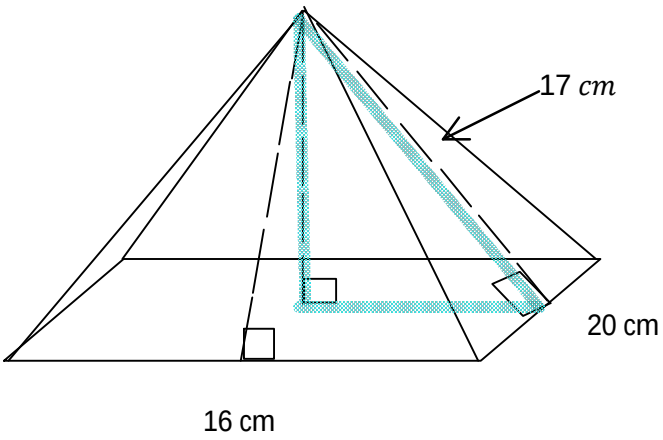
Step 2: Solve the volume.

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

$$\boxed{V = 12\pi\ cm^3}$$

M10 - 2.3 - Pyramid Volume Pythagoras Notes

Rectangular Based Pyramid

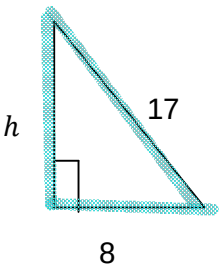


$$V = \frac{1}{3} \times (area\ of\ base) \times h$$

$$V = \frac{1}{3} \times (l \times w) \times h$$

$l = 20cm$
$w = 16cm$
$h = ?$

Step 1: Solve for the height, h, of the pyramid using the Pythagorean Thm.



$$17^2 = 8^2 + h^2$$
$$17^2 - 8^2 = h^2$$
$$h^2 = 17^2 - 8^2$$
$$h^2 = 225$$
$$h = \sqrt{225}$$
$$h = 15$$

Step 2: Find the Volume.

$$V = \frac{1}{3} \times 20 \times 16 \times 15$$

$$\boxed{V = 1600cm^3}$$