M8/10 - 5/7.0 - SA/V Notes

Square

$2cm$

$2cm$

$A = l \times w$

$A = 2 \times 2$

$A = 4cm^2$

$p = l + l + w + w$

$p = 2 + 2 + 2 + 2$

$p = 8cm$

Rectangle

$2m$

$3m$

$A = l \times w$

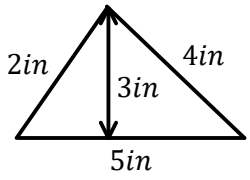
$A = 2 \times 3$

$A = 6m^2$

$p = l + l + w + w$

$p = 2 + 2 + 3 + 3$

$p = 10cm$



Note: Not true triangle

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

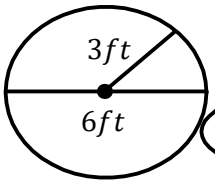
$A = \frac{5 \times 3}{2}$

$A = 7.5in^2$

$p = a + b + c$

$p = 2 + 4 + 5$

$p = 11in$



$A = \pi r^2$

$A = \pi(3)^2$

$A = 9\pi\ ft^2$

$A = 28.27\ ft^2$

$C = 2\pi r$

$C = 2\pi(3)$

$C = 6\pi\ ft$

$C = 18.85\ ft$

$Terms\ of\ \pi$

Missing Dimensions :

$A = 8m^2$ $2m$

$l = 2$

$A = lw$

$8 = (2)w$

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

$4m = w$

Composite Shapes :

$2m$

Semi-circle/ Square

$A = lw$

$A = 2 \times 2$

$A = 4m^2$

$A = \pi r^2$

$A = \pi(1)^2$

$A = \pi\ m^2$

$A = 3.14\ m^2$

$A_{Total} = (4 + \pi)m^2$

$A_T = 7.14\ m^2$

$A = 9\pi\ m^2$

$A = \pi r^2$

$9\pi = \pi r^2$

$9 = r^2$

$\sqrt{9} = \sqrt{r^2}$

$r = 3$

Divide both sides by π

Prisms :

Rectangular Base

4cm

2cm

3cm

Cube

3cm

3cm

3cm

3cm

3cm

$9cm^2$

$SA = 9cm^2 + 9cm^2 + 9cm^2 + \ldots$

$SA = 54cm^2$

3cm

4cm

2cm

$12cm^2$

$8cm^2$

$6cm^2$

$8cm^2$

$12cm^2$

$6cm^2$

$V = (area\ of\ base) \times (height)$

$V = (lw)h$

$V = 5 \times 4 \times 3$

$V = 60cm^3$

$SA = 12cm^2 + 12cm^2 + 8cm^2 + 8cm^2 + 6cm^2 + 6cm^2$

$SA = 52cm^2$

$V = (area\ of\ base) \times (height)$

$V = (lw)h$

$V = 3 \times 3 \times 3$

$V = 27cm^3$

5cm

5cm

Triangular

3cm

6cm

8cm

5

3

8

6

$12cm^2$

$30cm^2$

$48cm^2$

$30cm^2$

$12cm^2$

$V = (area\ of\ base) \times (height)$

$V = \left(\frac{bh}{2}\right) \times (H)$

$V = \frac{(8)(3)}{2} \times (10)$

$V = 120cm^3$

$a^2 + b^2 = c^2$

3

5

4

$SA = 12cm^2 + 12cm^2 + 30cm^2 + 30cm^2 + 48cm^2$

$SA = 132cm^2$

3cm

8cm

Cylinder

28.3

$18.84cm$

Area $= l \times w$

A $= 18.84 \times 8$

A $= 150.7$

8

28.3

$SA = 28.27 + 28.27 + 150.72$

$SA = 207.26\ cm^2 = 66\ \pi\ cm^2$

Notice: the width of the rectangle is the circumference of the circle.

$V = (area\ of\ base) \times (height)$

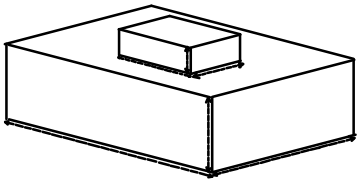
$V = (\pi r^2)h$

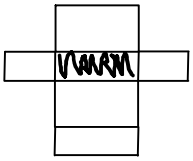
$V = (3.14)(3)^2(8)$

$V = 226.19cm^3$

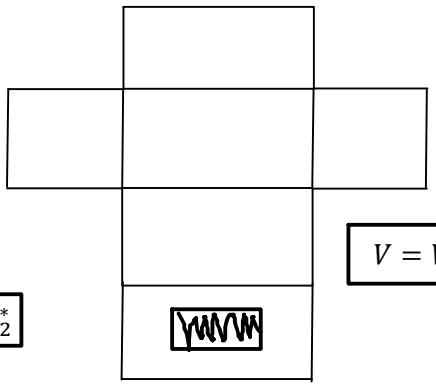
M8/10 - 5/7.0 - SA/V Notes

Composite Shapes





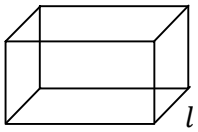
$SA = SA_1 \pm SA_2^*$



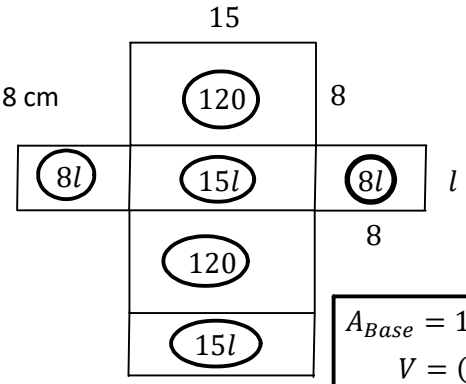
$V = V_1 + V_2$

Missing Dimension :

$SA = 700\ cm^2$



$V = 1200\ cm^2$



$SA = 2wl + 2hl + 2wh$

$700 = 30l + 16l + 240$

$-240 \qquad -240$

$460 = 46l$

$\frac{460}{46} = \frac{46l}{46}$

$10 = l$

$l = 10\ cm$

$V = (area\ of\ base) \times (h)$

$V = lwh$

$1200 = 15(8)l$

$\frac{1200}{120} = \frac{120l}{120}$

$l = 10cm$

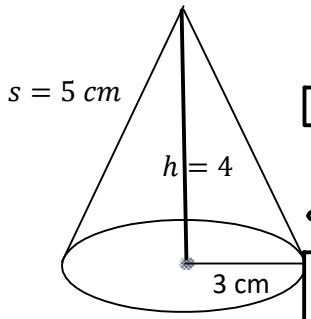
$A_{Base} = 150\ cm^2$

$V = (area\ of\ base) \times (h)$

$\frac{1200}{150} = \frac{150h}{150}$

$h = 8cm$

Cone



$a^2 + b^2 = c^2$

$b = 4$

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

$SA = (3.14)(3)^2 + (3.14)(3)(5)$

$SA = 28.27 + 47.12$

$SA = 75.40\ cm^2 = 24\pi\ cm^2$

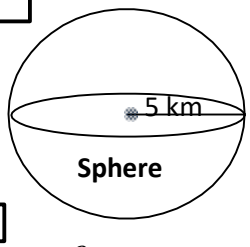
We don't lay the cone flat until Calculus*.

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

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

$V = \frac{1}{3} \times \left((3.14)(3)^2\right) \times 4$

$V = 37.7\ m^3 = 12\pi\ m^3$



Sphere

$SA = 4\pi r^2$

$SA = 4(3.14)(5)^2$

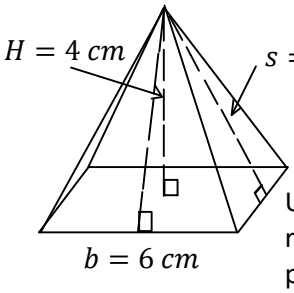
$SA = 314\ km^2 = 100\pi\ km^2$

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

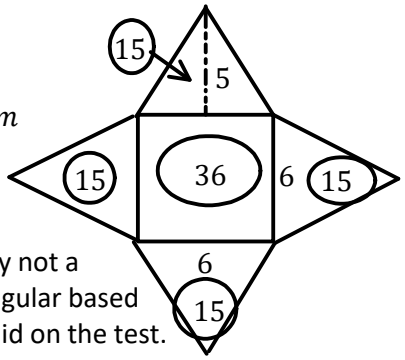
$V = \frac{4}{3}(3.14)(5)^3$

$V = 523.6\ km^3 = \frac{100}{3}\pi\ km^3$

Square Based Pyramid



Usually not a rectangular based pyramid on the test.



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

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

$V = \frac{1}{3} \times (6 \times 6) \times 4$

$V = 48\ cm^3$

$SA = 2bs + b^2$

$SA = 2(6)(5) + (6)^2$

$SA = 60 + 36$

$SA = 96\ cm^2$

$SA = 15 + 15 + 15 + 15 + 36$

$SA = 96\ cm^2$

$Given\ V_{Sphere} = 40\pi\ m^3$

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

$400\pi = \frac{4}{3}\pi r^3$ Divide both sides by π

$400 = \frac{4}{3}r^3$

$3 \times 400 = \frac{4}{3}r^3 \times 3$

$400 = 4r^3$

$\frac{400}{4} = \frac{4r^3}{4}$

M8/10 - 5/7.0 - SA/V WP's/Algebra Notes

$P = 96$

$l = (w + 10)$

w

$P = 2w + 2l$
$96 = 2w + 2l$
$\frac{96}{2} = \frac{2w}{2} + \frac{2l}{2}$
$48 = w + l$
$48 = w + (w + 10)$
$-10 \qquad\qquad -10$
$38 = 2w$
$\frac{38}{2} = \frac{2w}{2}$
$w = 14$

$l = (w + 10)$
$l = 24$

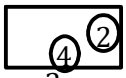
$l = 24$

$w = 14$

$24 + 24 + 14 + 14 = 96$

A rectangle's length is twice it's width. Find the Area if the Perimeter is $12\ m$.

let $w = width$



$P = 2w + 2l$
$12 = 6w$
$w = 2$
$12 = 2(2) + 2(4)$

Check

$8 = 2(2) \times 2$

$A = lw$
$A = 2w \times w$
$A = 2w^2$
$A = 2(2)^2$
$A = 8\ m^2$

Words Problems	Solve (Algebra)
Diagram	Substitute
Let Statements	Solve
Equation/s	Answer in English!
(Arbitrary#'s)	Check Answer!
Isolate	(Eliminate*)
Substitute	Explain it to a 10 year old!

Find r in terms or C.

$C = 2\pi r$
$\frac{C}{2\pi} = \frac{2\pi r}{2\pi}$
$r = \frac{C}{2\pi}$

Find r in terms or A.

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

Find r in terms or V

$V = \frac{4}{3}\pi r^3$
$3 \times V = \frac{4}{3}r^3 \times 3$
$3V = 4\pi r^3$
$\frac{3V}{4\pi} = \frac{4\pi r^3}{4\pi}$
$\frac{3V}{4\pi} = r^3$
$\sqrt[3]{\frac{3V}{4\pi}} = \sqrt[3]{r^3}$
$r = \sqrt[3]{\frac{3V}{4\pi}}$

Convert to $y = mx + b$

$ax + by = c$
$-ax \qquad -ax$
$\frac{by}{b} = -\frac{ax}{b} + \frac{c}{b}$
$y = -\frac{a}{b}x + \frac{c}{b}$

Find V in terms of d

$V = \frac{4}{3}\pi r^3$ $\qquad d = 2r$
$V = \frac{4}{3}\pi(\frac{d}{2})^3$ $\qquad r = \frac{d}{2}$
$V = \frac{4}{3}\pi\frac{d^3}{8}$
$V = \frac{1}{6}\pi d^3$