

SURFACE AREA & VOLUME REVIEW G12 SOLUTIONS (TOOK ME 1 HOUR) 1

① a) TOTAL DISTANCE TRAVELLED (T.D.T.)

$$\begin{aligned} &= 4(10) + 4(7) + 4(6) \\ &= 4(10 + 7 + 6) \\ &= 4(23) \\ &= \underline{\underline{92 \text{ in}}} \end{aligned}$$

b) S.A. = $2(70) + 2(60) + 2(42)$

$$\begin{aligned} &= 2(172) \\ &= \underline{\underline{344 \text{ sq. in}}} \end{aligned}$$

c) $V = B \cdot h$

$$\begin{aligned} &= (10 - 7) \cdot 6 \\ &= \underline{\underline{18 \text{ cu. in}}} \end{aligned}$$

d) $10^2 + 7^2 = DB^2$

$$149 = DB^2$$

$$\underline{\underline{\sqrt{149} \text{ in} = DB}} \text{ (EXACT)}$$

$$\underline{\underline{DB \approx 12.207 \text{ in} \text{ (APPROX)}}}$$

e) $(\sqrt{149})^2 + 6^2 = HB^2$

$$149 + 36 = HB^2$$

$$185 = HB^2$$

$$\underline{\underline{\sqrt{185} \text{ in} = HB}} \text{ (EXACT)}$$

$$\underline{\underline{HB \approx 13.601 \text{ in} \text{ (APPROX)}}}$$

② a) S.A. = $2 \cdot \pi \cdot (4)^2 + 2\pi(4)(22)$

$$S.A. = 32\pi + 176\pi$$

$$\underline{\underline{S.A. = 208\pi \text{ sq. ft} \text{ (EXACT)}}$$

$$\underline{\underline{S.A. \approx 653.451 \text{ sq. ft} \text{ (APPROX)}}$$

b) $V = \pi(4)^2(22) = 352\pi \text{ cu. ft. (EXACT)}$

$$\underline{\underline{V \approx 1105.841 \text{ cu. ft. (APPROX)}}$$

③ a) T.D.T.

$$\begin{aligned} &= 4(4\sqrt{3}) + 2(4\sqrt{6}) + 3(18) \\ &= \underline{\underline{(16\sqrt{3} + 8\sqrt{6} + 54) \text{ in} \text{ (EXACT)}}} \end{aligned}$$

$$\underline{\underline{\approx 101.309 \text{ in} \text{ (APPROX)}}$$

b) S.A. = $2\left(\frac{1}{2}(4\sqrt{3})(4\sqrt{3})\right) + 2(4\sqrt{3} \cdot 18)$
 $+ 1(4\sqrt{6} \cdot 18)$

$$\underline{\underline{S.A. = (40 + 144\sqrt{3} + 72\sqrt{6}) \text{ sq. in} \text{ (EXACT)}}$$

$$\underline{\underline{S.A. \approx 473.779 \text{ sq. in} \text{ (APPROX)}}$$

c) $V = B \cdot h$

$$= \frac{1}{2}(4\sqrt{3} \times 4\sqrt{3}) \cdot 18$$

$$= \underline{\underline{432 \text{ cu. in} \text{ (EXACT ONLY)}}$$

④ a) S.A. = $\pi(9)(15) + \pi(9)^2$

$$= 135\pi + 81\pi$$

$$= \underline{\underline{216\pi \text{ sq. m} \text{ (EXACT)}}$$

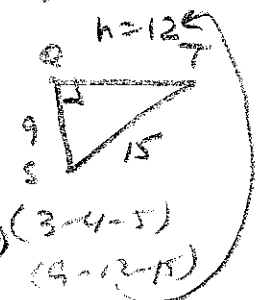
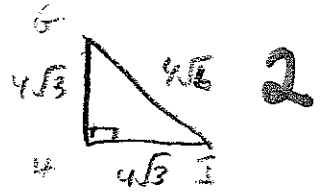
$$\underline{\underline{\approx 678.584 \text{ sq. m} \text{ (APPROX)}}$$

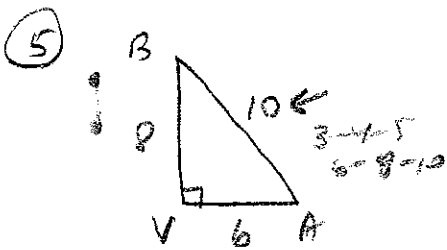
b) $V = \frac{1}{3}\pi(9)^2(h)$

$$V = \frac{1}{3}\pi(9)^2(12)$$

$$\underline{\underline{V = 324\pi \text{ cu. m. (EXACT)}}$$

$$\underline{\underline{V = 1017.876 \text{ cu. m} \text{ (APPROX)}}$$





$$x^2 = 6^2 + 8^2$$

$$x^2 = 136$$

$$x = \sqrt{136} = 2\sqrt{34}$$

$$a) T.D.T. = 4(2\sqrt{34}) + 4(12)$$

$$= (8\sqrt{34} + 48) \text{ cm (EXACT)}$$

$$\approx \underline{\underline{94.648 \text{ cm (APPROX)}}}$$

$$A) S.A. = (12 \times 12) + 4\left(\frac{1}{2}(12)(10)\right)$$

$$= 144 + 2(120)$$

$$= 144 + 240$$

$$= \underline{\underline{384 \text{ sq cm}}}$$

$$c) V = \frac{1}{3}(12 \cdot 12) \cdot (8)$$

$$V = \underline{\underline{384 \text{ cu cm.}}}$$

$$d) \text{NO. } 384 \text{ sq cm} \neq 384 \text{ cu cm.}$$

$$6) a) T.D.T. = 4(18 + 8 + 12)$$

$$= 4(38)$$

$$= \underline{\underline{152 \text{ cm}}}$$

$$A) S.A. = 2(18 \cdot 8 + 8 \cdot 12 + 18 \cdot 12)$$

$$= \underline{\underline{912 \text{ sq cm}}}$$

$$6) c) V = (12 \cdot 8) \cdot 12$$

$$V = \underline{\underline{1728 \text{ cu cm}}}$$

$$1) 18^2 + 8^2 = PR^2$$

$$324 + 64 = PR^2$$

$$388 = PR^2$$

$$PR = \underline{\underline{2\sqrt{97} \text{ cm (EXACT)}}}$$

$$PR \approx \underline{\underline{19.698 \text{ cm (APPROX)}}}$$

$$e) (2\sqrt{97})^2 + 12^2 = PV^2$$

$$388 + 144 = PV^2$$

$$532 = PV^2$$

$$PV = \underline{\underline{2\sqrt{133} \text{ cm (EXACT)}}}$$

$$PV \approx \underline{\underline{23.065 \text{ cm (APPROX)}}}$$

$$7) a) T.D.T. = 6(10) + 3(30)$$

$$= 60 + 90$$

$$= \underline{\underline{150 \text{ cm}}}$$

b)

$$S.A. = 2\left(\frac{1}{2}(10 \cdot 5\sqrt{3})\right)$$

$$+ 3(10 \cdot 30)$$

$$S.A. = \underline{\underline{(50\sqrt{3} + 900) \text{ sq cm (EXACT)}}}$$

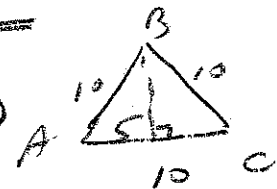
$$S.A. \approx \underline{\underline{986.603 \text{ sq cm (APPROX)}}}$$

$$c) V = \left(\frac{1}{2} \cdot 10 \cdot 5\sqrt{3}\right) \cdot 30$$

$$V = \underline{\underline{750\sqrt{3} \text{ cu cm} \approx 1299.038 \text{ cu cm}}}$$

(EXACT)

(APPROX)



VERY DIFFERENT UNIT

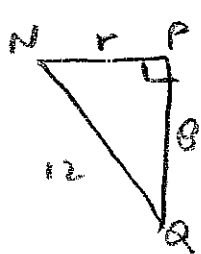
$$\begin{aligned} 8a) S.A. &= 2 \cdot \pi \cdot (7)^2 + 2\pi(7)(15) \\ &= 98\pi + 210\pi \\ &= 308\pi \text{ sq. m. (exact)} \\ &= \underline{\underline{967.611 \text{ sq. m}}} \\ &\quad \text{(Approx)} \end{aligned}$$

$$1) V = \pi(7)^2(15)$$

$$V = \underline{\underline{735\pi \text{ cu. m. (exact)}}$$

$$V = \underline{\underline{2309.071 \text{ cu. m.}}} \\ \text{(Approx)}$$

$$9a) S.A. = \pi r^2 + \pi r l$$



$$r^2 + 8^2 = 12^2$$

$$r^2 = 144 - 64$$

$$r^2 = 80$$

$$r = \sqrt{80}$$

$$r = 4\sqrt{5}$$

$$S.A. = \pi(\sqrt{80})^2 + \pi(4\sqrt{5})(12)$$

$$S.A. = \underline{\underline{(80\pi + 48\sqrt{5}\pi) \text{ sq. in}}} \\ \text{(exact)}$$

$$S.A. = \underline{\underline{588.519 \text{ sq. in}}}$$

$$2) V = \frac{1}{3}\pi(\sqrt{80})^2(8)$$

$$V = \frac{1}{3}\pi \cdot 640$$

$$V = \frac{640\pi}{3} \text{ cu in (exact)}$$

$$V = \underline{\underline{670.206 \text{ cu. in}}} \\ \text{(Approx)}$$

$$\begin{aligned} 10a) T.O.T. &= 6(4\sqrt{6}) \\ &= \underline{\underline{24\sqrt{6} \text{ in (exact)}}} \\ &= \underline{\underline{58.788 \text{ in}}} \\ &\quad \text{(Approx)} \end{aligned}$$

b)



$$h = 2\sqrt{6} \cdot \sqrt{3}$$

$$h = 2 \cdot 3\sqrt{2}$$

$$h = 6\sqrt{2}$$

$$A_D = \frac{1}{2}(4\sqrt{6})(6\sqrt{2})$$

$$A_D = 12\sqrt{12}$$

$$A_D = 12 \cdot 2\sqrt{3}$$

$$A_D = 24\sqrt{3}$$

$$S.A. = 4(24\sqrt{3})$$

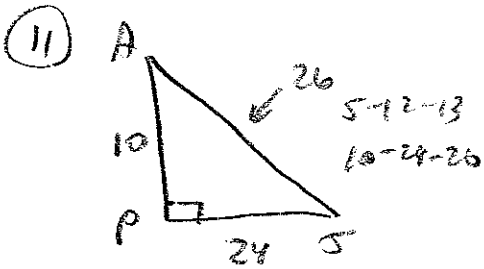
$$= \underline{\underline{96\sqrt{3} \text{ sq in}}} \\ \text{(exact)}$$

$$= \underline{\underline{166.277 \text{ sq in}}} \\ \text{(Approx)}$$

$$c) V = \frac{1}{3}(24\sqrt{3})(8)$$

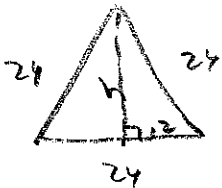
$$V = \underline{\underline{64\sqrt{3} \text{ cu in (exact)}}$$

$$V = \underline{\underline{110.851 \text{ cu. in}}} \\ \text{(Approx)}$$



$$\begin{aligned} \text{a) T.O.T.} &= 6(26) + 6(24) \\ &= 6(50) \\ &= \underline{\underline{300 \text{ ft}}} \end{aligned}$$

b) Hexagonal container of
6 EQUIL Δ s:



$$h = 12\sqrt{3}$$

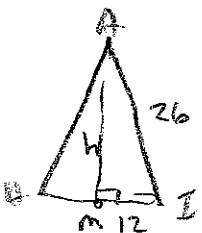
$$A_D = \frac{1}{2}(24)(12\sqrt{3})$$

$$A_D = 144\sqrt{3}$$

$$A_{\text{area}} = 6 \cdot 144\sqrt{3}$$

$$A_{\text{area}} = \underline{\underline{864\sqrt{3}}}$$

$$A_{\text{LATERAL}} = \frac{1}{2}(24) \cdot h$$



$$12^2 + h^2 = 26^2$$

$$h^2 = 532$$

$$h = \sqrt{532} = 2\sqrt{133}$$

b) CONT

$$\begin{aligned} A_{\text{LATERAL}} &= \frac{1}{2}(24) \cdot 2\sqrt{133} \\ &= 24\sqrt{133} \end{aligned}$$

$$\begin{aligned} \text{S.A.} &= A_{\text{area}} + 6 \cdot A_{\text{LATERAL}} \\ &= 864\sqrt{3} + 6 \cdot 24\sqrt{133} \end{aligned}$$

$$\text{S.A.} = \underline{\underline{(864\sqrt{3} + 144\sqrt{133}) \text{ SQ. FT}}}$$

(EXACT)

$$= \underline{\underline{3157.181 \text{ SQ. FT (APPROX)}}}$$

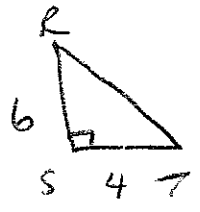
c) $V = \frac{1}{3} \cdot B \cdot h$

$$= \frac{1}{3} \cdot 864\sqrt{3} \cdot 10$$

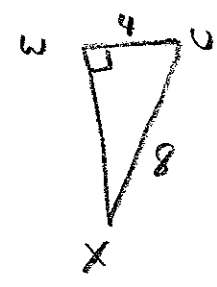
$$= \underline{\underline{2880\sqrt{3} \text{ CU FT (EXACT)}}}$$

$$V = \underline{\underline{4988.306 \text{ CU FT (APPROX)}}}$$

12) TOP:



Bottom:



$w \times h = 4\sqrt{3}$

$RT^2 = 4^2 + 6^2$

$RT^2 = 16 + 36$

$RT = \sqrt{52}$

$RT = 2\sqrt{13}$

S.A. _{TOP} = $\pi r A$
 $= \pi(4)(2\sqrt{13})$
 $= \underline{\underline{8\pi\sqrt{13}}}$

S.A. _{Bottom} = $\pi r A$
 $= \pi(4)(8)$
 $= \underline{\underline{32\pi}}$

S.A. _{circ} = $2\pi r h$
 $= 2\pi(4)(15)$
 $= \underline{\underline{120\pi}}$

a) S.A. = $8\pi\sqrt{13} + 32\pi + 120\pi$
 $= (8\pi\sqrt{13} + 152\pi)$ sq. m. (exact)
 $\hat{=} \underline{\underline{569.139}}$ sq. m (approx)

b) $V = \frac{1}{3}\pi(4)^2(6) + \frac{1}{3}\pi(4)^2(4\sqrt{3}) + \pi(4)^2(15)$
 $V = 32\pi + \frac{64\sqrt{3}}{3}\pi + 240\pi$
 $V = (272\pi + \frac{64\pi\sqrt{3}}{3})$ cu. m (exact)
 $\hat{=} \underline{\underline{970.596}}$ cu. m (approx)