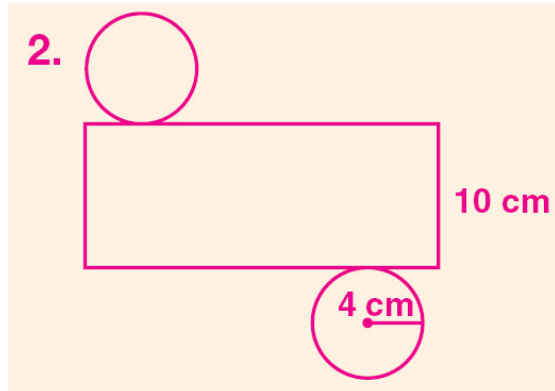
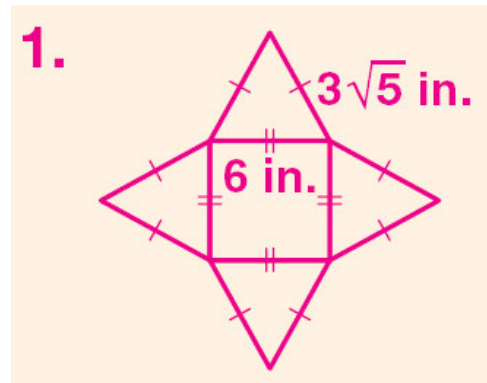


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8. Smallest volume = $(15)(8)(15) = 1800 \text{ in}^3$
 Largest volume = $(15)(8)(22) = 2640 \text{ in}^3$
9. Volume = $(8)(8)(13) = 832 \text{ in}^3$
10. Volume = $(11)(5)(4) = 220 \text{ cm}^3$
 Surface area = $(32)(4) + 2(11)(5) = 238 \text{ cm}^2$ (I used 11×5 as the base)
11. Volume = $(4/3)\pi(4)^3 = 268.1 \text{ ft}^3$
 Surface area = $4\pi(4)^2 = 201.1 \text{ ft}^2$
12. Slant height: $5^2 + 6^2 = L^2$; $L^2 = 61$; $L = \sqrt{61}$
 Volume = $(1/3)\pi(5)^2(6) = 157.1 \text{ m}^3$
 Surface area = $\pi(5)(\sqrt{61}) + \pi(5)^2 = 201.2 \text{ m}^2$
13. Volume = $\pi(3)^2(8) = 226.2 \text{ cm}^3$
 Surface Area = $2\pi(3)(8) + 2\pi(3)^2 = 207.3 \text{ cm}^2$
14. Height: $4^2 + h^2 = 9^2$; $16 + h^2 = 81$; $h^2 = 65$; $h = \sqrt{65}$
 Volume = $(1/3)[(8)(8)](\sqrt{65}) = 172.0 \text{ in}^3$
 Surface Area = $0.5(32)(9) + (8)(8) = 208 \text{ in}^2$
15. **** Note **** For surface area, I treat this like a prism with a strangely shaped base. For volume, I treat it like two halves of a cylinder stuck on a prism.
 Volume = Vol of Cylinder + Vol of box = $\pi(\frac{1}{2})^2(12) + (6)(12)(1) = 81.4 \text{ in}^3$
 Surface Area = $(12 + \pi)(12) + 2[(6)(1) + \pi(\frac{1}{2})^2] = 195.3 \text{ in}^2$

18. Lateral Area of room: $(12+15+12+15)(7) = 378 \text{ ft}^2$

This is fewer square feet than what is covered by one gallon, so you only need the one gallon.

19. A) $V = 5^3 = 125 \text{ cm}^3$

B) $V = \pi(4)^2(4) = 64 \pi \text{ cm}^3 \approx 201.06 \text{ cm}^3$

C) $V = (1/3)(6)(6)(6) = 72 \text{ cm}^3$

D) $V = (1/3)\pi(4)^2(9) = 48\pi \text{ cm}^3 \approx 150.80 \text{ cm}^3$

E) $V = (5)(5)(6) = 150 \text{ cm}^3$

ANSWER: C, A, E, D, B

20. You might want to know the volume of your hot water heater so you know how long your shower will last. You may want to know the lateral area of a room so you know how much paint to buy.

21. Similarity ratio is 4:5, so Volume ratio is $4^3:5^3$ or 64:125

22. Volume ratio is $327\pi:8829\pi = 1:27$

The similarity ratio will be the cube root of $1/27$, which is $1/3$

The surface area ratio will be $1^2:3^2 = 1:9$