

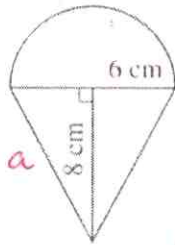
1. Find the perimeter and the area of the following figures. Leave answers as exact values.
If there is a shaded region, find the perimeter and area of the shaded region only.

a.

$$P = 6\pi + 20 \text{ cm}$$

$$A = 18\pi + 48 \text{ cm}^2$$

$$104.52 \text{ cm}^2$$



$$P = \text{semicircle} + 2 \text{ sides } \Delta$$

$$C \text{ semicircle} = \frac{12\pi}{2} = 6\pi$$

$$\text{side } a \text{ of triangle is } 8^2 + 6^2 = a^2, a = 10$$

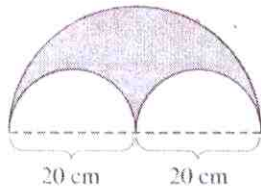
$$\text{so } P = 6\pi + 10 + 10 = 12\pi + 20 \text{ cm}$$

$$A = \text{area semicircle} + \text{area big } \Delta$$

$$= \frac{1}{2}\pi(6^2) + \frac{1}{2}(12 \cdot 8)$$

$$= 18\pi + 48 \text{ cm}^2$$

b.



$$P = 1 \text{ big semicircle} + 1 \text{ small semicircle}$$

$$= \frac{1}{2}(40\pi) + \frac{1}{2}(20\pi)$$

$$= 20\pi + 20\pi = 40\pi \text{ cm}$$

$$A = \text{area Big semi} - \text{area small circle}$$

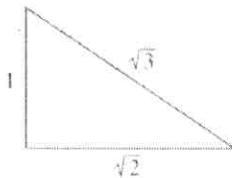
$$= \frac{1}{2}\pi(20^2) - \pi(10)^2 \text{ cm}^2$$

$$= 200\pi - 100\pi = 100\pi \text{ cm}^2$$

2. Determine whether each of the following is a right triangle.

Show your work and state how you know.

a.

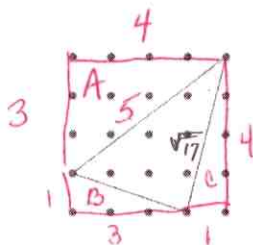


Converse Pythagorean Theorem

$$\text{Is } 1^2 + (\sqrt{2})^2 = (\sqrt{3})^2 ?$$

$$1 + 2 = 3 \quad \boxed{\text{YES}}$$

b.



Converse Pythagorean Theorem

$$\text{Side } c^2 = 1^2 + 4^2 \quad \text{so } c = \sqrt{17}$$

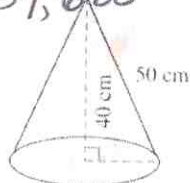
$$\text{Side } b^2 = 1^2 + 3^2 \quad \text{so } b = \sqrt{10}$$

$$\text{Is } (\sqrt{10})^2 + (\sqrt{17})^2 = 5^2 ?$$

$$10 + 17 = 25 \quad \boxed{\text{NO}}$$

3. Find the volume of each of the following.

a. ~~$300\pi \text{ cm}^3$~~
 $12000\pi \text{ cm}^3$
 $\approx 37,680$



a. Right circular cone

$$V_{\text{cone}} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \pi (30^2) \cdot 40$$

$$= \frac{1}{3} (900\pi) \cdot 40$$

$$= \boxed{12000\pi \text{ cm}^3}$$

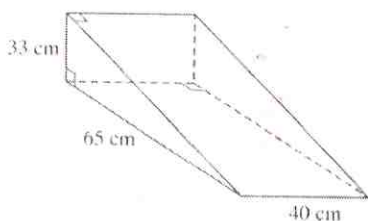
$$r^2 + 40^2 = 50^2$$

$$r^2 + 1600 = 2500$$

$$r^2 = 900$$

$$r = 30$$

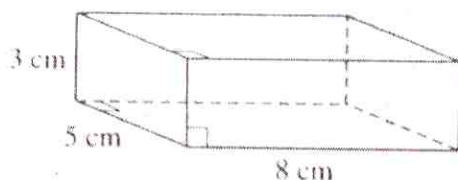
b. $42,900 \text{ cm}^3$



b. Right triangular prism

Base is 1 triangle
 Area of Base = $\frac{1}{2} (33)(65) = \boxed{1072.5}$
 Volume = $1072.5 (40)$
 $= \boxed{42,900 \text{ cm}^3}$

c. 120 cm^3

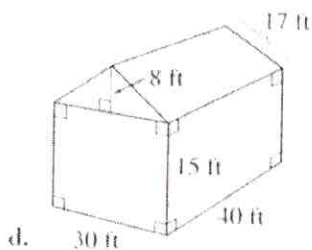


c. Right rectangular prism

$$\text{Volume} = 3 \times 5 \times 8$$

$$= 120 \text{ cm}^3$$

d. ~~$18,800 \text{ ft}^3$~~
 $22,800 \text{ ft}^3$



d.

Volume Box + Volume triangular prism
 $(30 \times 40 \times 15) + \frac{1}{2} (8)(30)(40)$
 $18,000 + 4800$
 $= \boxed{22,800 \text{ ft}^3}$

$$\begin{array}{r} 30 \\ 40 \\ \hline 1200 \end{array}$$

$$\begin{array}{r} 1200 \\ 4 \\ \hline 4800 \end{array}$$

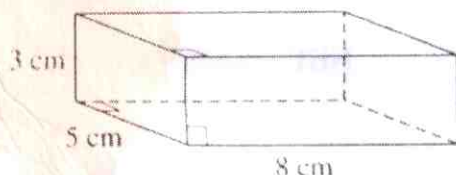
$$\begin{array}{r} 1200 \\ 15 \\ \hline 6000 \end{array}$$

$$\begin{array}{r} 65 \\ 33 \\ \hline 195 \end{array}$$

$$\begin{array}{r} 1072.5 \\ 2 \overline{) 2145} \\ \underline{2145} \\ 0 \end{array}$$

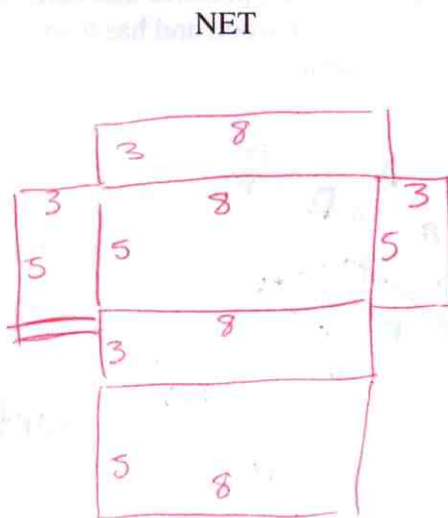
$$\begin{array}{r} 1072.5 \\ 40 \\ \hline 42900 \end{array}$$

4. Draw a net that would produce this box. Then find the total surface area of this box.



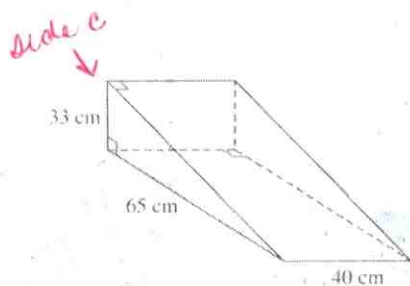
Right rectangular prism

$$\begin{aligned} 2(3 \times 8) &= 2(24) = 48 \\ 2(3 \times 5) &= 2(15) = 30 \\ 2(5 \times 8) &= 2(40) = 80 \\ &\underline{158} \end{aligned}$$



Total surface Area of box = 158 cm²

5. Draw a net that would produce this ramp. Then find the total surface area for this ramp.
DO NOT include the bottom the ramp in either the net or the total surface area. This ramp is hollow and does not have a bottom. It just sits on the ground.



Right triangular prism

Find side c use Pythagorean

$$(33)^2 + (40)^2 = c^2$$

$$1089 + 1600 = c^2$$

$$2689 = c^2$$

$$\sqrt{2689} = c$$

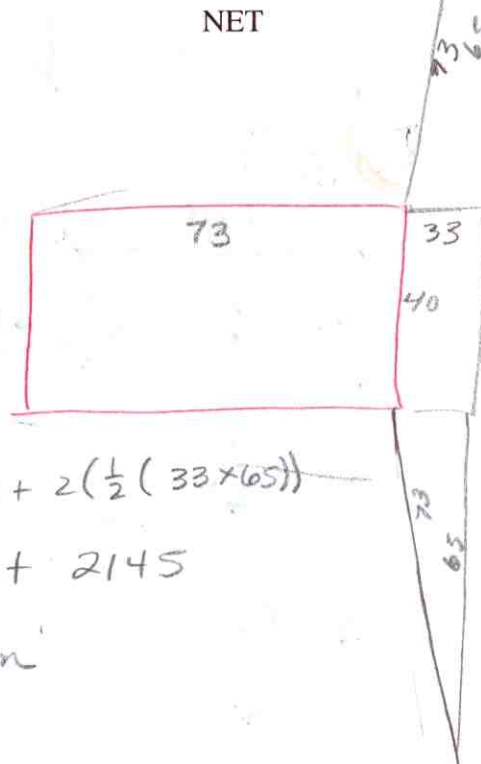
$$51.85 = c$$

$$SA = (40 \times 51.85) + (40 \times 33) + 2\left(\frac{1}{2}(33 \times 40)\right)$$

$$= 2074 + 1320 + 1320$$

$$= 4714 \text{ square cm}$$

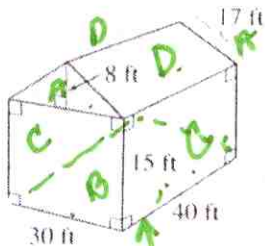
NET



Total Surface Area of ramp = _____

5. Draw a net that would produce this barn-shape and then find the total surface area of this barn. The barn is made of wood and has a wooden floor, so include the floor in the net and in the surface area.

NET



Floor = "F"

Surface Area =

$$2A = 2\left(\frac{1}{2}(30 \cdot 8)\right) = 240$$

$$2B = 2(40 \times 15) = 1200$$

$$2C = 2(40 \times 15) = 1200$$

$$2D = 2(40 \times 17) = 1360$$

$$A + F = 30 \times 40$$

$$\begin{array}{r} 240 \\ 1200 \\ 1200 \\ 1360 \\ \hline 4900 \end{array}$$

59 ft

