

9.2

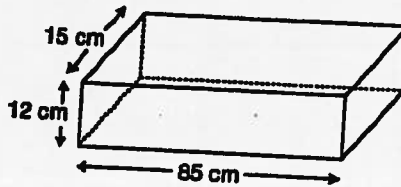
Surface Area of Prisms and Pyramids

Date: _____

Section
9.2

Where necessary, round your answers to one decimal place.

1. Draw and label a net for the rectangular prism.



2. Find the surface area of the prism in question 1.

Two faces have dimensions _____ cm by _____ cm.

$$\begin{aligned} \text{Area} &= ____ \times ____ \\ &= ____ \end{aligned}$$

Two faces have dimensions _____ cm by _____ cm.

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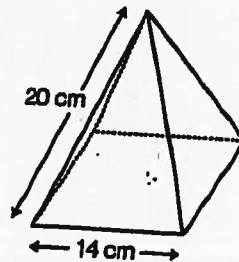
Two faces have dimensions _____ cm by _____ cm.

$$\begin{aligned} \text{Area} &= ____ \times ____ \\ &= ____ \end{aligned}$$

$$\begin{aligned} \text{Surface Area} &= 2(____) + 2(____) + 2(____) \\ &= ____ \end{aligned}$$

The surface area of the prism is _____ cm².

3. Draw and label a net for this square-based pyramid.



Date: _____



4. Find the surface area of the pyramid in question 3.

STEP 1: Find the height of each triangular face of the pyramid using Pythagorean theorem. Round your answer to two decimal places.

$$h^2 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$h^2 = \underline{\hspace{2cm}} - \underline{\hspace{2cm}}$$

$$h^2 = \sqrt{\hspace{2cm}}$$

$$h^2 \doteq \underline{\hspace{2cm}}$$

STEP 2: Find the surface area of each triangular face, which are congruent because it is a square-based pyramid. Round your answer to one decimal place.

$$\text{Surface area of each triangular face} = \frac{1}{2}bh$$

$$= \frac{1}{2}(\underline{\hspace{2cm}})(\underline{\hspace{2cm}})$$

$$= \underline{\hspace{2cm}}$$

STEP 3: Find the *total* surface area of the pyramid.

Since there are 4 congruent triangular faces:

$$\text{SA of triangular faces} = 4(\underline{\hspace{2cm}})$$

$$= \underline{\hspace{2cm}}$$

$$\text{SA of base} = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\text{The total surface area of the pyramid is } \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}.$$

5. The foundation of a new garage has walls that are 2.5 m high. The garage is 8 m long and 10 m wide. The walls of the foundation are to be sprayed with a waterproofing tar.

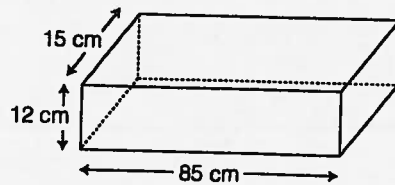
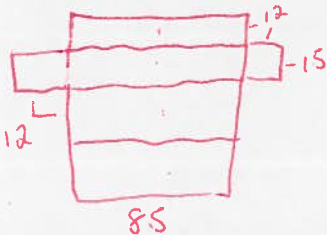
a) Find the surface area of the exterior walls of the garage.

b) The waterproofing spray costs \$13.95 per square metre. How much will the spray cost?

Surface Area of Prisms and Pyramids

Where necessary, round your answers to one decimal place.

1. Draw and label a net for the rectangular prism.



2. Find the surface area of the prism in question 1.

Two faces have dimensions 15 cm by 12 cm.

$$\begin{aligned} \text{Area} &= \underline{15\text{ cm}} \times \underline{12\text{ cm}} \\ &= \underline{180\text{ cm}^2} \end{aligned}$$

Two faces have dimensions 15 cm by 85 cm.

$$\begin{aligned} \text{Area} &= \underline{15\text{ cm}^2} \times \underline{85\text{ cm}^2} \\ &= \underline{1275\text{ cm}^2} \end{aligned}$$

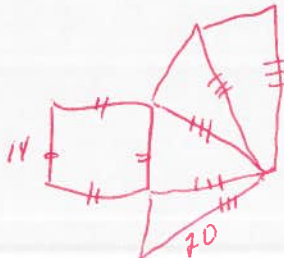
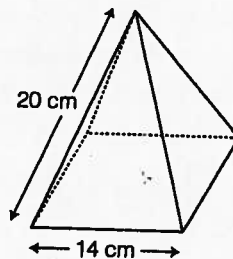
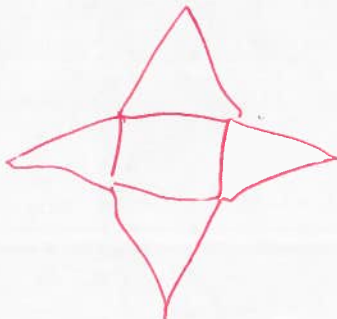
Two faces have dimensions 12 cm by 85 cm.

$$\begin{aligned} \text{Area} &= \underline{12\text{ cm}} \times \underline{85\text{ cm}} \\ &= \underline{1020\text{ cm}^2} \end{aligned}$$

$$\begin{aligned} \text{Surface Area} &= 2(\underline{1020}) + 2(\underline{1275}) + 2(\underline{180}) \\ &= \underline{4950\text{ cm}^2} \end{aligned}$$

The surface area of the prism is 4950 cm².

3. Draw and label a net for this square-based pyramid.





4. Find the surface area of the pyramid in question 3.

STEP 1: Find the height of each triangular face of the pyramid using Pythagorean theorem. Round your answer to two decimal places.

$$h^2 + 7^2 = 20^2$$

$$h^2 = 20^2 - 7^2$$

$$h^2 = \sqrt{20^2 - 7^2}$$

$$h^2 = 18.73$$

STEP 2: Find the surface area of each triangular face, which are congruent because it is a square-based pyramid. Round your answer to one decimal place.

$$\text{Surface area of each triangular face} = \frac{1}{2}bh$$

$$= \frac{1}{2}(14)(18.73)$$

$$= 131.1 \text{ cm}^2$$

STEP 3: Find the total surface area of the pyramid.

Since there are 4 congruent triangular faces:

$$\text{SA of triangular faces} = 4(131.1 \text{ cm}^2)$$

$$= 524.4 \text{ cm}^2$$

$$\text{SA of base} = 14 \times 4$$

$$= 196 \text{ cm}^2$$

$$\text{The total surface area of the pyramid is } 196 \text{ cm}^2 + 524.4 \text{ cm}^2 = 720.4 \text{ cm}^2$$

5. The foundation of a new garage has walls that are 2.5 m high. The garage is 8 m long and 10 m wide. The walls of the foundation are to be sprayed with a waterproofing tar.
- a) Find the surface area of the exterior walls of the garage.

$$90 \text{ m}^2$$

- b) The waterproofing spray costs \$13.95 per square metre. How much will the spray cost?

$$\$ 1225.50$$