4.4 Surface Area of a Right Triangular Prism – Notes
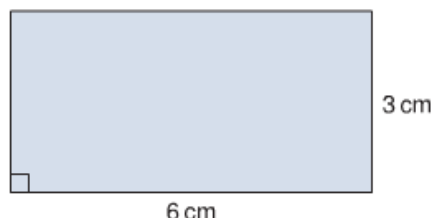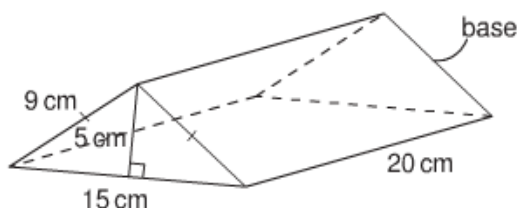
What is the area of this rectangle?

3 cm

6 cm

$A_{rectangle} = b \times h$
$= 6 \times 3$
$= 18 cm^2$

What is the area of this triangle?

$A_{triangle} = \dfrac{bh}{2}$

$= \dfrac{5 \times 4}{2}$

$= \dfrac{20}{2}$

$= 10 cm^2$

4 cm

5 cm

Here is a right triangular prism.

Draw a net of this prism.

9 cm
5 cm
15 cm
base
20 cm

5 cm

A 15 cm

20 cm   C   D   E

B 5 cm
9 cm   9 cm

Label the 5 shapes A to E.

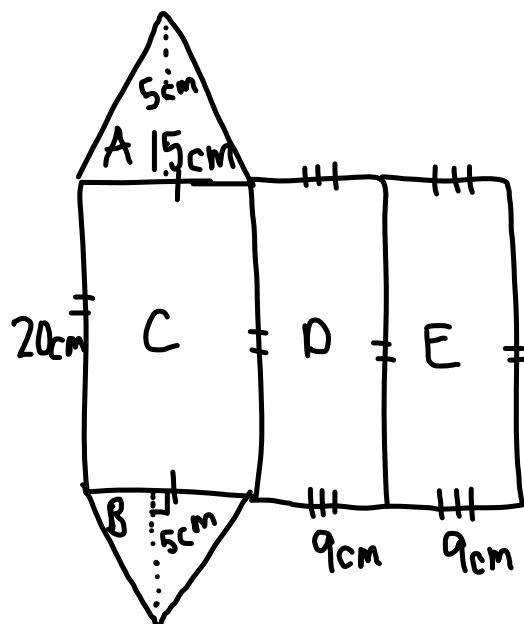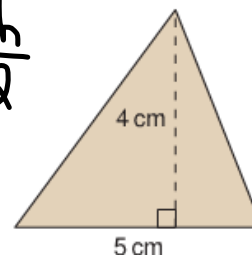Find the area of each rectangle.

$A = \dfrac{15 \times 5}{2} = \dfrac{75}{2} = 37.5$

$B = \dfrac{15 \times 5}{2} = \dfrac{75}{2} = 37.5$

$C = 15 \times 20 = 300$

$D = 9 \times 20 = 180$

$E = 9 \times 20 = 180$
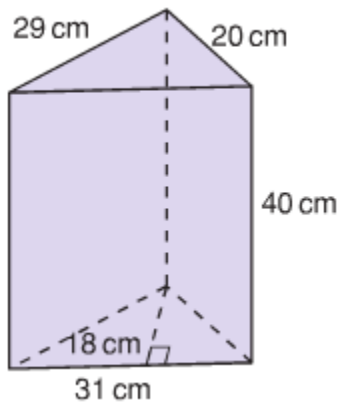
The surface area of the triangular prims is the sum of the 5 areas.

$S.A_{T.P.} = 37.5 + 37.5 + 300 + 180 + 180 = 735 cm^2$

Example (2): Find the surface area of this triangular prism. Draw its net if it helps!

29 cm   20 cm

40 cm

18 cm

31 cm

Top & Bottom: $2\left(\dfrac{31\times18}{2}\right) = 558$

Front: $31 \times 40 = 1240$

Left: $28 \times 40 = 1120$

right: $20 \times 40 = 800$

$$S.A_{T.P} = 558 + 1240 + 1120 + 800$$
$$= 3718 \, cm^2$$

Example (3): A wooden doorstop is a triangular prism. It is to be painted. The bottom rectangular face is covered with rubber and will not be painted. Find the total surface area to be painted.

16.7 cm

5.0 cm

8.9 cm

15.9 cm
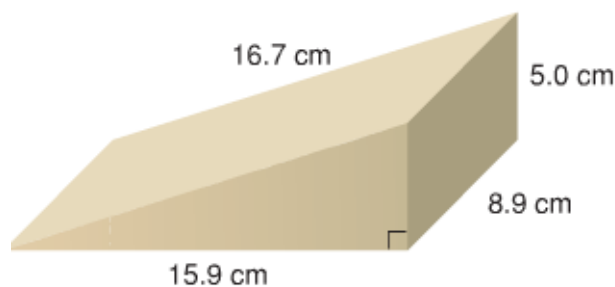
Front & Back: $2\left(\dfrac{15.9\times5}{2}\right) = 79.5$

right: $5 \times 8.9 = 44.5$

top: $16.7 \times 8.9 = 148.63$

$$S.A_{T.P} = 79.5 + 44.5 + 148.63$$
$$= 272.63 \, cm^2$$