Name Key Class _____ Date _____

Reteaching 9-3

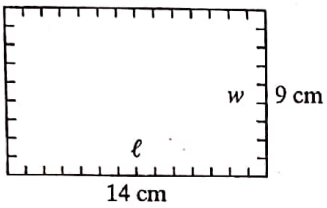
Perimeters and Areas of Rectangles

Perimeter

The *perimeter* of a figure is the sum of the lengths of its sides. Opposite sides of a rectangle are equal. To find the perimeter, add the 2 lengths (ℓ) and the 2 widths (w).

$P = \ell + \ell + w + w$ or $P = 2\ell + 2w$

Find the perimeter.



$P = 2\ell + 2w$
$= 2(14) + 2(9)$
$= 28 + 18 = 46$

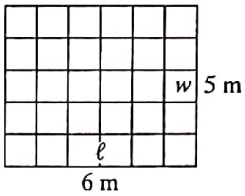
The perimeter is 46 centimeters.

Area

The *area* of a figure is the number of square units needed to cover the figure. To find the area of a rectangle, multiply the length (ℓ) and the width (w).

$A = \ell \times w$

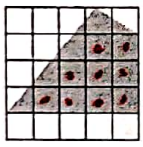
Find the area.



$A = \ell \times w$
$= 6 \times 5$
$= 30$

The area is 30 square meters.

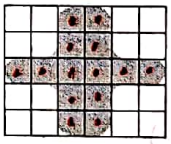
Estimate the area of each figure. Each square represents 1 square inch.

1. 

12 sq. in

2. 

5 sq. in

3. 

14 sq. in

Find the perimeter and area of each rectangle or square.

4. $\ell = 12$ cm, $w = 2$ cm
$P = 12+12+2+2 = 28$ cm $A = 12 \cdot 2 = 24$ cm^2

5. $\ell = 9$ ft, $w = 7.5$ ft
$P = 9+9+7.5+7.5 = 33$ ft $A = 9 \times 7.5 = 67.5$ ft^2

6. $\ell = 2.5$ m, $w = 2.5$ m
$P = 2.5+2.5+2.5+2.5 = 10$ m $A = 2.5 \times 2.5 = 6.25$ m^2

7. $\ell = 5.5$ in., $w = 5.5$ in.
$P = 5.5+5.5+5.5+5.5 = 22$ in $A = 5.5 \times 5.5 = 30.25$ in^2

8. $\ell = 6.2$ in., $w = 3.4$ in.
$P = 6.2+6.2+3.4+3.4 = 19.2$ in $A = 6.2 \times 3.4 = 21.08$ in^2

9. $\ell = 4.5$ ft, $w = 0.75$ ft
$P = 4.5+4.5+0.75+0.75 = 10.5$ ft $A = 4.5 \times 0.75 = 3.375$ ft^2

10. What is the area of a square with a perimeter of 60 meters?
$P = 60 \div 4 = 15$ $A = 15 \times 15 = 225$ m^2

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Reteaching 9-4

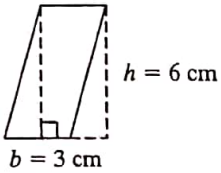
Areas of Parallelograms and Triangles

Parallelogram

To find the area of a parallelogram, multiply base times height.

$A = b \times h$

Find the area of the parallelogram.



$A = b \times h$
$= 3 \times 6$
$= 18$

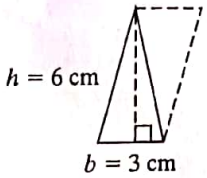
The area is 18 square centimeters.

Triangle

The area of a triangle is $\frac{1}{2}$ times the base times the height.

$A = \frac{1}{2}b \times h$ or $A = \frac{b \times h}{2}$

Find the area of the triangle.



$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 3 \times 6$
$= 9$

The area is 9 square centimeters.

Find the area of each parallelogram.

1. $b = 6$ ft, $h = 8$ ft
   $6 \times 8 = 48 ft^2$
2. $b = 12$ in., $h = 9$ in.
   $12 \times 9 = 108 in^2$
3. $b = 6$ yd, $h = 12$ yd
   $6 \times 12 = 72 yd^2$
4. $b = 2.8$ in., $h = 3.4$ in.
   $2.8 \times 3.4 = 9.52 in^2$
5. $b = 31$ yd, $h = 19$ yd
   $31 \times 19 = 589 yd^2$
6. $b = 4.5$ m, $h = 4.5$ m
   $4.5 \times 4.5 = 20.25 m^2$
7. $b = 15$ cm, $h = 7$ cm
   $15 \times 7 = 105 cm^2$
8. $b = 8.3$ ft, $h = 11.7$ ft
   $8.3 \times 11.7 = 97.11 ft^2$
9. $b = 14.4$ m, $h = 6.5$ m
   $14.4 \times 6.5 = 93.6 m^2$

Find the area of each triangle.

10. $b = 8$ cm, $h = 14$ cm
    $\frac{8 \cdot 14}{2} = \frac{112}{2} = 56 cm^2$
11. $b = 7$ in., $h = 18$ in.
    $\frac{7 \cdot 18}{2} = \frac{126}{2} = 63 in^2$
12. $b = 11$ m, $h = 4.6$ m
    $\frac{11 \cdot 4.6}{2} = \frac{50.6}{2} = 25.3 m^2$
13. $b = 6.4$ ft, $h = 3.5$ ft
    $\frac{6.4 \cdot 3.5}{2} = \frac{22.4}{2} = 11.2 ft^2$
14. $b = 104$ in., $h = 55$ in.
    $\frac{104 \cdot 55}{2} = \frac{5720}{2} = 2860 in^2$
15. $b = 5.9$ cm, $h = 4.2$ cm
    $\frac{5.9 \cdot 4.2}{2} = \frac{24.78}{2} = 12.39 cm^2$
16. $b = 1.7$ m, $h = 3.3$ m
    $\frac{1.7 \cdot 3.3}{2} = \frac{5.61}{2} = 2.805 m^2$
17. $b = 5.8$ yd, $h = 5.8$ yd
    $\frac{5.8 \cdot 5.8}{2} = \frac{33.64}{2} = 16.82 yd^2$
18. $b = 8.6$ in., $h = 0.8$ in.
    $\frac{8.6 \cdot 0.8}{2} = \frac{6.88}{2} = 3.44 in^2$

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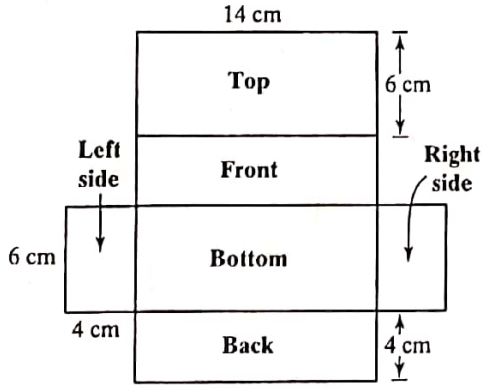
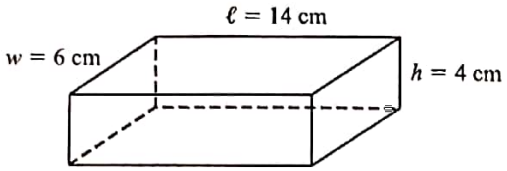
Reteaching 9-8

Surface Areas of Prisms

The *surface area* of a rectangular prism is the sum of the areas of the faces. You can use nets to find surface area.



Find the surface area of the prism.



area of top = area of bottom
area of front = area of back
area of right side = area of left side

① Find the area of the top.
$A = \ell \times w$
$= 14 \times 6$
$= 84 \text{ cm}^2$

② Find the area of the front.
$A = \ell \times h$
$= 14 \times 4$
$= 56 \text{ cm}^2$

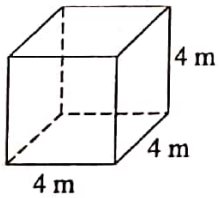
③ Find the area of the right side.
$A = w \times h$
$= 6 \times 4$
$= 24 \text{ cm}^2$

④ Add.
$84 + 84 + 56 + 56 + 24 + 24 = 328$

The surface area of the prism is 328 square centimeters.

Find the surface area of each prism.

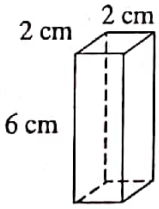
1.



4×4=16
4×4=16
4×4=16

16+16+16+16+16+16 = 96m²

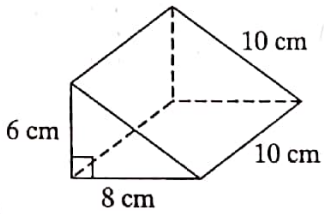
2.



2×2=4
2×6=12
2×6=12

4+4+12+12+12+12 = 56cm²

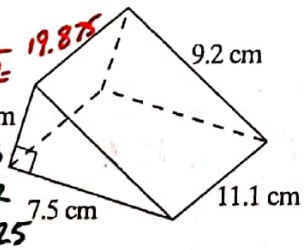
3.



$\frac{6 \cdot 8}{2} = \frac{48}{2} = 24$
6·10 = 60
10·10 = 100
8·10 = 80

24+24+60+100+80 = 264 cm²

4.

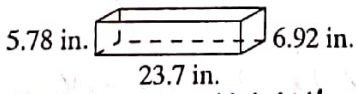


$\frac{7.5 \cdot 5.3}{2} = \frac{39.75}{2} = 19.875$
5.3·11.1 = 58.83
11.1·9.2 = 102.12
7.5·11.1 = 83.25

19.875+19.875+58.83+102.12+83.25

283.95 cm²

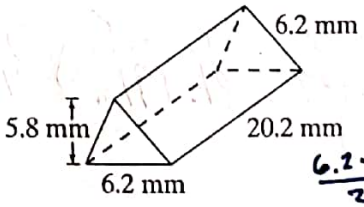
5.



23.7·6.92 = 164.004
164.004
23.7·5.78 = 136.986
136.986
5.78·6.92 = 39.9976
+ 39.9976

681.9752 in²

6.



$\frac{6.2 \cdot 5.8}{2} = 17.98$
17.98
6.2·20.2 = 125.24
125.24
+ 125.24

411.68 mm²

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Reteaching 9-9

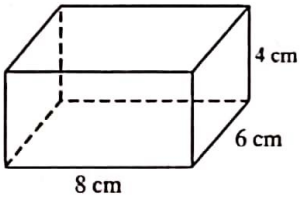
Volumes of Rectangular Prisms

Volume is the number of cubic units needed to fill the space inside a three-dimensional figure. It is measured in cubic units.

Find the volume of the rectangular prism.

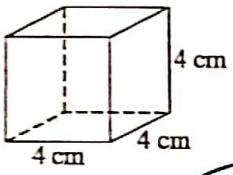
Volume = Area of base × height

$V = B \times h$
$= \ell \times w \times h$
$= 8 \times 6 \times 4$
$= 192$

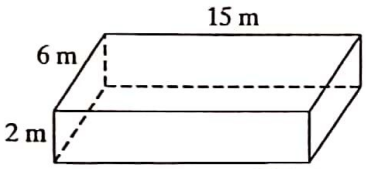


The volume is 192 cubic centimeters.

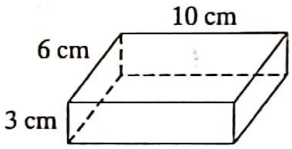
Find the volume of each rectangular prism.

1.


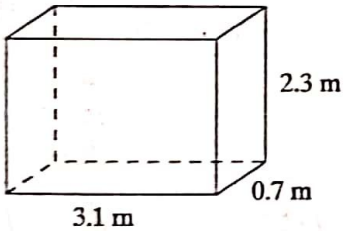
$4 \cdot 4 \cdot 4 = 64 \text{ cm}^3$

2.


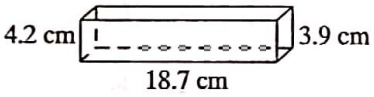
$2 \cdot 6 \cdot 15 = 180 \text{ m}^3$

3.


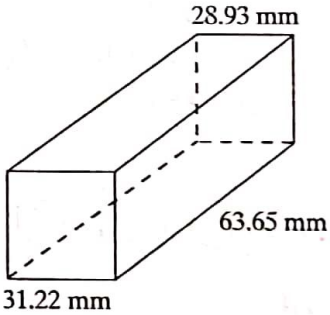
$3 \cdot 6 \cdot 10 = 180 \text{ cm}^3$

4.


$3.1 \cdot 0.7 \cdot 2.3 = 4.991 \text{ m}^3$

5.


$4.2 \cdot 18.7 \cdot 3.9 = 306.306 \text{ cm}^3$

6.


$31.22 \cdot 63.95 \cdot 28.93 = 57{,}759.29 \text{ mm}^3$

Find the volume of each rectangular prism with the given dimensions.

7. $\ell = 6$ in., $w = 9$ in., $h = 3$ in.

$6 \cdot 9 \cdot 3 = 162 \text{ in}^3$

8. $\ell = 3.5$ cm, $w = 1.5$ cm, $h = 7$ cm

$3.5 \cdot 1.5 \cdot 7 = 36.75 \text{ cm}^3$

9. $\ell = 16$ mm, $w = 18$ mm, $h = 2.5$ mm

$16 \cdot 18 \cdot 2.5 = 720 \text{ mm}^3$

10. $\ell = 5$ m, $w = 6.2$ m, $h = 3.9$ m

$5 \cdot 6.2 \cdot 3.9 = 120.9 \text{ m}^3$