

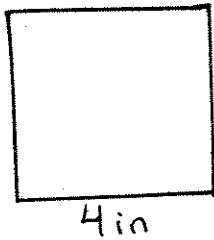
# ~~Section 12.1~~ Area: Parallelograms, Triangles, and Trapezoids

All important terms should be in the vocabulary section of your notebook.

Remember the label for area is always units squared (Ex. Inches squared)

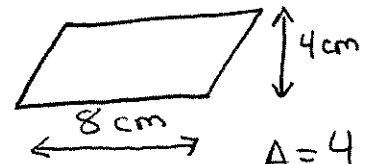
## Area of parallelogram

$A=bh$  which means multiply the base by the height and you will find the area for the parallelogram



$$A = 4 \text{ in} (5 \text{ in})$$

$$A = 20 \text{ inches squared}$$



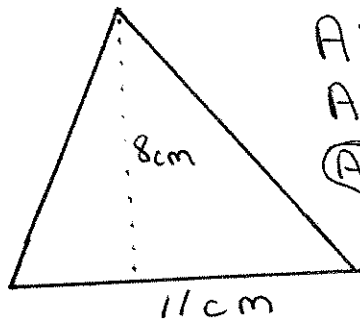
$$A = 4 \text{ cm} (8 \text{ cm})$$

$$A = 32 \text{ cm}^2$$

## Area of a triangle

If you take a parallelogram and draw a diagonal line through it you form two triangles, thus the area of a triangle is the same formula for the area of a parallelogram except you have to divide by two at the end (or multiply by  $\frac{1}{2}$  at the end, both ways give you the same answer).

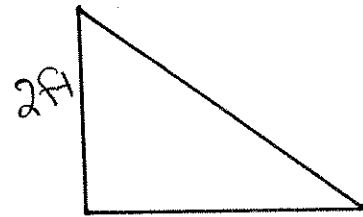
$A = \frac{1}{2}(b)(h)$  which means area =  $\frac{1}{2}$  times the base and height or base times height then divide by two



$$A = \frac{1}{2}(8 \text{ cm})(11 \text{ cm})$$

$$A = \frac{1}{2}(88 \text{ cm}^2)$$

$$A = 44 \text{ cm}^2$$



$$A = \frac{1}{2}(3 \text{ ft})(2 \text{ ft})$$

$$A = \frac{1}{2}(6 \text{ ft}^2)$$

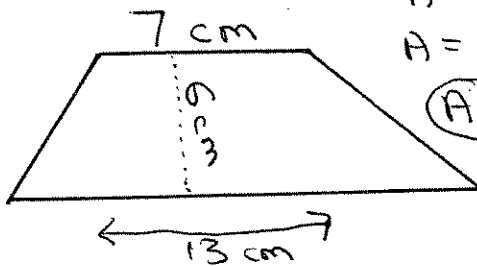
$$A = 3 \text{ ft}^2$$

## Area of a trapezoid

To find the area of a trapezoid (which is a parallelogram with only one pair of parallel sides) you add the two bases together (the two parallel sides) then multiply this number by the altitude (which is the height or the line that connects the two bases) then divide by two (or multiply by  $\frac{1}{2}$ )

$$A = \frac{1}{2}(h)(a + b)$$

a and b are the two bases, h is the height or altitude

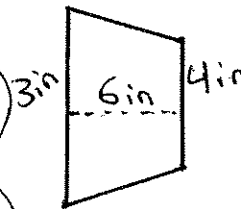


$$A = \frac{1}{2}(6 \text{ cm})(7 \text{ cm} + 13 \text{ cm})$$

$$A = \frac{1}{2}(6 \text{ cm})(20 \text{ cm})$$

$$A = \frac{1}{2}(120 \text{ cm}^2)$$

$$A = 60 \text{ cm}^2$$



$$A = \frac{1}{2}(6 \text{ in})(3 \text{ in} + 6 \text{ in})$$

$$A = \frac{1}{2}(6 \text{ in})(9 \text{ in})$$

$$A = \frac{1}{2}(54 \text{ in}^2)$$

$$A = 27 \text{ in}^2$$

# ~~Section 12~~ Area of a Circle

All important terms should be in the vocabulary section of your notebook.

$$\text{Radius} = \frac{1}{2} (\text{Diameter})$$

Remember the label for area is always units squared (Ex. Inches squared)

Radius is the distance from the center of a circle to the edge of the circle

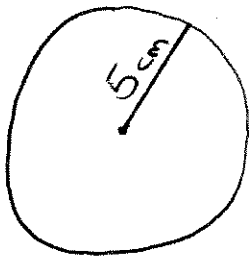
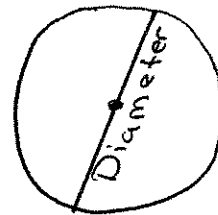
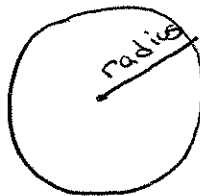
Circumference is the length around a circle - Formula is  $C = \pi d$

Diameter is the length across a circle that cuts through the center

Pi is expressed as  $\frac{22}{7}$  or 3.14 ( $\pi$ )

## Area of circle

$$\text{Area} = \pi(\text{radius})^2$$



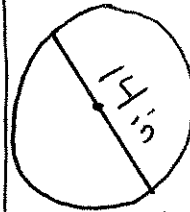
$$r = 5 \text{ cm}$$

$$A = \pi r^2$$

$$A = 3.14(5)^2$$

$$A = 3.14(25)$$

$$A = 78.75 \text{ cm}^2$$



$$d = 14 \text{ in}$$

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

$$r = 7$$

$$A = \pi r^2$$

$$A = 3.14(7)^2$$

$$A = 3.14(49)$$

$$A = 153.86 \text{ in.}^2$$



Square Area

$$(4 \text{ ft})(8 \text{ ft}) = 32 \text{ ft}^2$$

Semi-Circle Area

$$D = 12 \text{ ft}$$

$$R = \frac{1}{2} D$$

$$R = \frac{1}{2}(12)$$

$$R = 6 \text{ ft}$$

$$A = \pi(r^2)\left(\frac{1}{2}\right)$$

$$A = 3.14(6)^2\left(\frac{1}{2}\right) \Rightarrow A = 3.14(36)\left(\frac{1}{2}\right) \Rightarrow A = 56.52 \text{ ft}^2$$

Total Area

$$\text{Square} + \text{Semi-Cir}$$

$$A = 32 \text{ ft}^2 + 56.52 \text{ ft}^2$$

$$A = 88.52 \text{ ft}^2$$

# ~~Section 12.5~~ Surface Area: Prisms and Cylinders

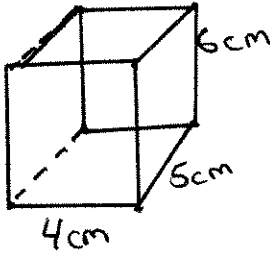
All important terms should be in the vocabulary section of your notebook.

Remember the label for area is always units squared (Ex. Inches squared)

Surface area is the total area of all sides of a 3-dimensional figure

To find surface area, find the area of each side (or face) and add them together

## Area of a prism



Bottom + Top

$$A = 4 \times 5$$

$$A = 20 \text{ cm}$$

$$20 \times 2 = 40 \text{ cm}^2$$

Sides

$$A = 5 \times 6$$

$$A = 30 \text{ cm}^2$$

$$30 \times 2 = 60 \text{ cm}^2$$

Front + Back

$$A = 6 \times 4$$

$$A = 24 \text{ cm}^2$$

$$24 \times 2 = 48 \text{ cm}^2$$

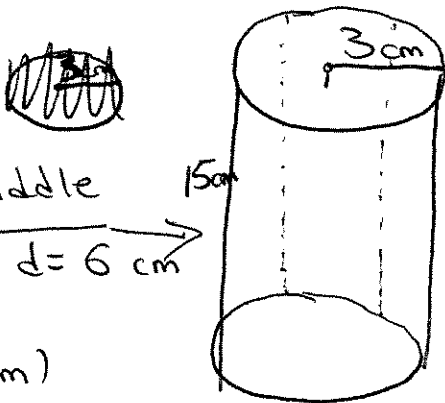
Multipled each area by 2  
to account for both sides

$$\text{surface area} = 40 \text{ cm}^2 + 60 \text{ cm}^2 + 48 \text{ cm}^2$$

$$\text{Surface area} = 148 \text{ cm}^2$$

## Area of a cylinder

\*To find the area of the top and bottom of a cylinder just use the area of a circle formula. Remember there is a top and bottom to every closed cylinder. Now to find the area of the middle section you need to remember that if we folded the middle section out it would become a rectangle. So the height of the cylinder is used for the height in the area of a rectangle formula. Now to find the base we need to find the circumference [circumference = pi(diameter)] Once you have the base and the height multiply them together to get the area of the midsection.



Area of Top

$$R = 3 \text{ cm}$$

$$A = \pi r^2$$

$$A = 3.14 (3)^2$$

$$A = 3.14 (9)$$

$$A = 28.26 \text{ cm}^2$$

Area of Bottom

Same as top

$$A = 28.26 \text{ cm}^2$$

Area of middle

$$l = 15 \text{ cm} \quad d = 6 \text{ cm}$$

$$C = \pi d$$

$$= 3.14 (6 \text{ cm})$$

$$= 18.84 \text{ cm}$$

$$= \text{base of middle}$$

$$= \text{base} \times \text{height}$$

$$= 18.84 (15)$$

$$= 282.6 \text{ cm}^2$$

Surface Area

Top + Bottom + middle

$$SA = 28.26 \text{ cm}^2 + 28.26 \text{ cm}^2 + 282.6 \text{ cm}^2$$

$$SA = 339.12 \text{ cm}^2$$

# ~~Section 12.7~~ Volume: Prisms and Cylinders

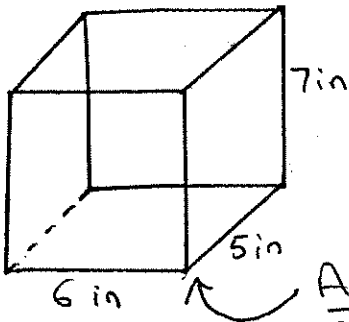
All important terms should be in the vocabulary section of your notebook.

Remember the label for volume is always units cubed (Ex. Inches cubed)

Volume is the amount a container will hold or its capacity

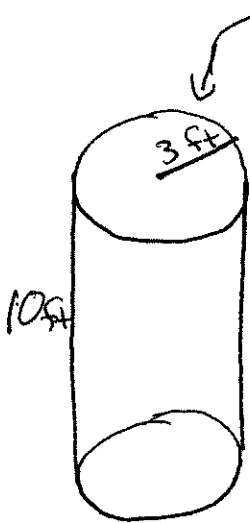
To find volume, you must find the area of one of the bases then multiply this number by the height of the object

## Volume of a prism



①	②
Area of base	Volume of Prism
$A = 5(6)$	$V = Ah$
$A = 30 \text{ in}^2$	$V = 30 \text{ in}^2(7 \text{ in})$
	$V = 210 \text{ in}^3$

## Volume of a cylinder



①	②
Area of Base	Volume of Cylinder
$A = \pi r^2$	$V = \text{Area of Base}(\text{Height})$
$r = 3 \text{ ft}$	$V = (28.26 \text{ ft}^2)(10 \text{ ft})$
$A = (3.14)(3 \text{ ft})^2$	$V = 282.6 \text{ ft}^3$
$A = 3.14(9 \text{ ft}^2)$	
$A = 28.26 \text{ ft}^2$	