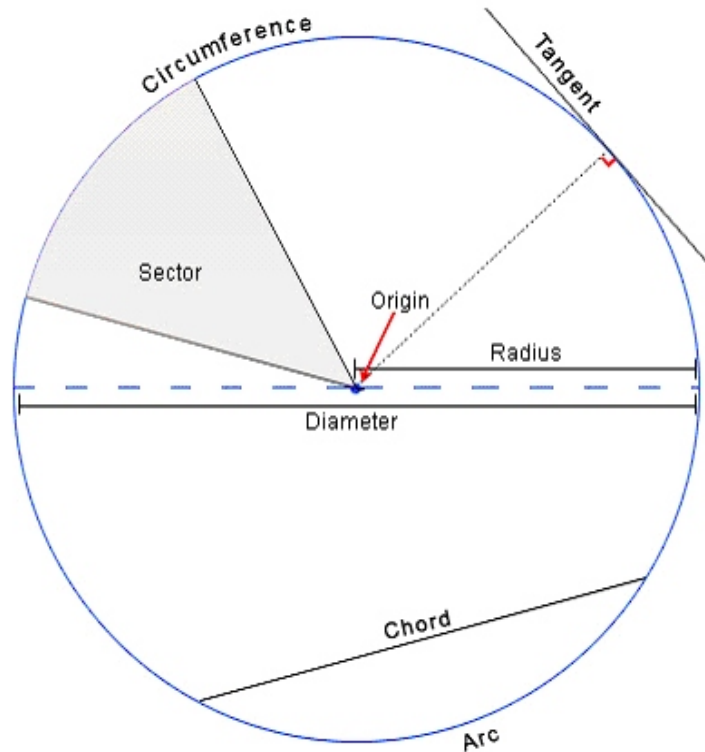


Properties of a Circle

Diagram Source: <http://www.ricksmath.com/circles.html>



Definitions:

Circumference (c):

The perimeter of a circle is called its circumference

Diameter (d):

Any straight line drawn through the centre and terminating at both ways by the circumference is called a diameter.

Origin:

Origin refers to the center of a circle

Pi:

An approximate value of is $\frac{22}{7}$ which is correct to two decimal places. A more accurate value of is 3.14159 which is correct to five decimal places.

$$\text{Pi} = C/d$$

Radius (r) - radii:

The constant distance of every point on the circle from its centre is called the radius of the circle. It is half of the diameter.

Enrichment Terms: *These terms will not be tested*

Arc:

A continuous piece of a circle is called an arc. In other words, any portion of the circumference of a circle is called an arc.

Chord:

A straight line joining any two points on the circumference of a circle is called a chord.

Sector:

A sector is that part of a circle, which lies between an arc and two radii joining the extremities of the centre. The most important sector is a quadrant, which is one-fourth of the circle.

Tangent of a circle:

It is a line perpendicular to the radius that touches only one point on the circle.

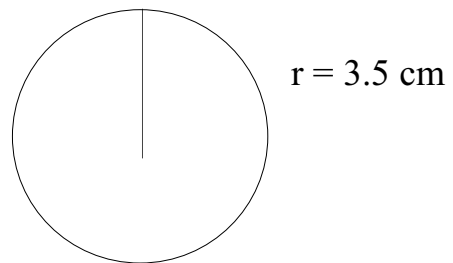
Formulas for Circles

Circumference (C) of a circle:

▶ $C = \text{Pi} (2r) \text{ or } \text{Pi} (d)$

$r = 3.5 \text{ cm}$

Find the measurement of the circumference.
Solve for C.



$C = 3.14 (2 \times 3.5 \text{ cm})$

$C = 3.14 \times 7 \text{ cm}$

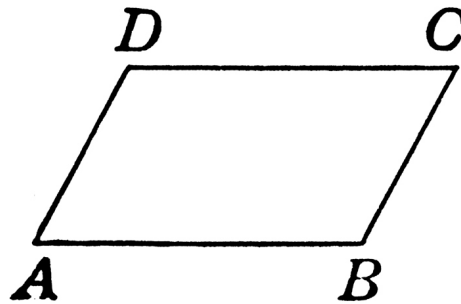
$$\begin{array}{r} 3.14 \\ \times \quad 7 \\ \hline 21.98 \end{array}$$

The circumference of the circle is 21.98 cm.

Area of a Parallelogram

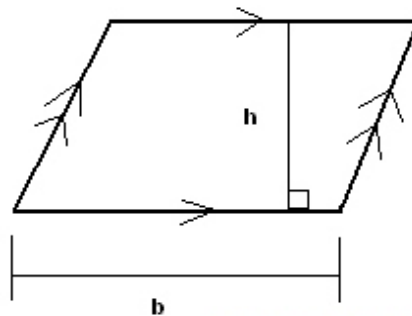
- ▶ A parallelogram is a polygon. It is a four sided plane figure with opposite sides parallel and the same length.

Ex.



- ▶ Area of a parallelogram equals base multiplied by the height

$$A = b \times h \quad \text{or} \quad A = bh$$



www.analyzemath.com

- ▶ If a parallelogram has a base of 9 cm and the height is 6 cm, what is the area of the figure?

$$A = bh$$

$$A = b \times h$$

$$A = 9 \text{ cm} \times 6 \text{ cm}$$

$$A = 54 \text{ cm}^2$$

The area of the parallelogram is 54 cm^2 .

- ▶ If you are provided with the area of a parallelogram and one other measurement of either base or height, it is possible to find the missing measurement.

Finding *height* of a parallelogram:

Divide the area by the base to find the height measurement of a parallelogram.

$$h = A / b$$

$$h = 54 \text{ cm}^2 / 9 \text{ cm}$$

$$h = 6 \text{ cm}$$

The height of the parallelogram is 6 cm.

Finding *base* of a parallelogram:

Area = 54 cm² and the base is 9 cm.

Divide the area by the height to find the base measurement of a parallelogram.

$$b = A / h$$

$$b = 54 \text{ cm}^2 / 6 \text{ cm}$$

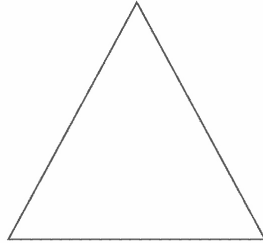
$$b = 9 \text{ cm}$$

The base of the parallelogram is 9 cm.

Area of a Triangle

- ▶ A triangle is a polygon. It is a three sided figure.

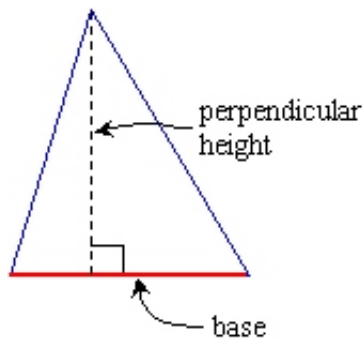
Ex.



- ▶ Area of a triangle equals half of base multiplied by height.

$$A = 1 / 2 (b \times h)$$

$$A = bh / 2$$



- ▶ If a triangle has a base of 8 cm and a height of 5 cm, what is the area of the figure?

$$A = bh / 2$$

$$A = (8 \text{ cm} \times 5 \text{ cm}) / 2$$

$$A = 40 \text{ cm} / 2$$

$$A = 20 \text{ cm}^2$$

The area of the triangle is 20 cm².

- ▶ If you are provided with the area of a triangle and one other measurement of either base or height, it is possible to find the missing measurement.

Finding *height* of a triangle:

Divide twice the area by the base to find the height measurement of a parallelogram.

$$h = 2A / b$$

$$h = (2 \times 20 \text{ cm}^2) / 8 \text{ cm}$$

$$h = 40 \text{ cm}^2 / 8 \text{ cm}$$

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

The height of the triangle is 5 cm.

Finding *base* of a triangle:

Divide twice the area by the height to find the base measurement of a parallelogram.

$$b = 2A / h$$

$$b = 2 \times 20 \text{ cm}^2 / 5 \text{ cm}$$

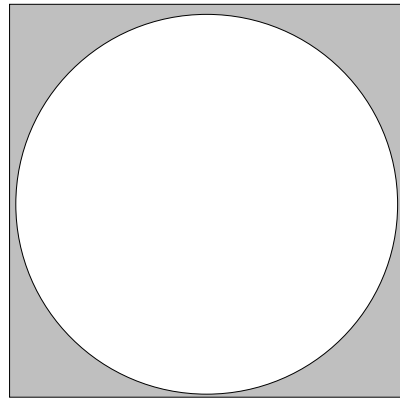
$$b = 40 \text{ cm}^2 / 5 \text{ cm}$$

$$b = 8 \text{ cm}$$

The base of the triangle is 8 cm.

More to do with Area:

Example #1:



$$h = 6 \text{ cm}$$

$$b = 6 \text{ cm}$$

- ▶ Area of the parallelogram = bh

$$A = 6 \text{ cm} \times 6 \text{ cm}$$

$$A = 36 \text{ cm}^2$$

- ▶ Area of the circle = $\text{Pi } r^2$

$$A = 3.14 \times 3 \text{ cm} \times 3 \text{ cm}$$

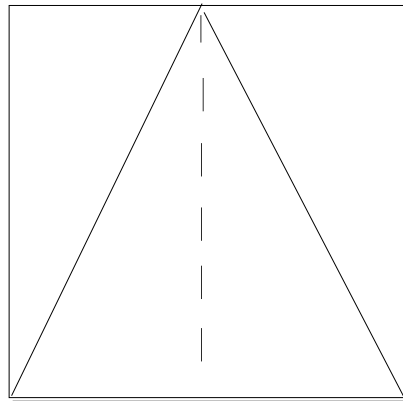
$$A = 3.14 \times 9 \text{ cm}$$

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

- ▶ Area of the shaded region = Area of the parallelogram subtract Area of the circle

$$A = 36 \text{ cm}^2 - 28.26 \text{ cm}^2$$

Example #2:



$$h = 7 \text{ cm}$$

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

- ▶ Area of the parallelogram = bh

$$A = 5 \text{ cm} \times 7 \text{ cm}$$

$$A = 35 \text{ cm}^2$$

- ▶ Area of the triangle = $bh / 2$

$$A = (5 \text{ cm} \times 7 \text{ cm}) / 2$$

$$A = 35 \text{ cm} / 2$$

$$A = 17.5 \text{ cm}^2$$

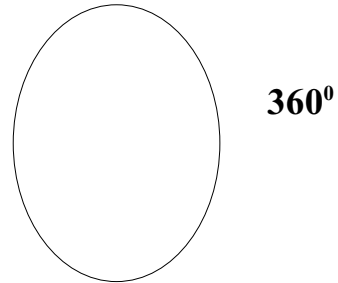
- ▶ A of the region outside of the triangle, but within the parallelogram =
A of the parallelogram - A of the triangle

$$A = 35 \text{ cm}^2 - 17.5 \text{ cm}^2$$

$$A = 17.5 \text{ cm}^2$$

Circle Graphs

- ▶ A circle has 360° round its origin.



Finding angle measurements of a circle graph:

$$30\% + 35\% + 25\% + 10\% = 100$$

Convert the sector percent to a decimal.

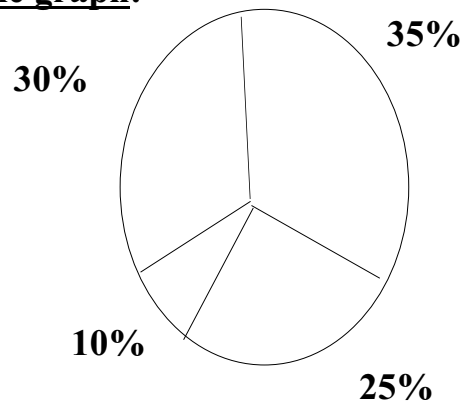
$$30 \div 100 = 0.30$$

$$35 \div 100 = 0.35$$

$$25 \div 100 = 0.25$$

$$\underline{10} \div 100 = \underline{0.10}$$

$$100 \quad 1.00 \times 100 = 100$$



Multiply 360 by the sectors decimal to find the sector's angle measurement.

$$360 \times 0.30 = 108^{\circ}$$

$$360 \times 0.35 = 126^{\circ}$$

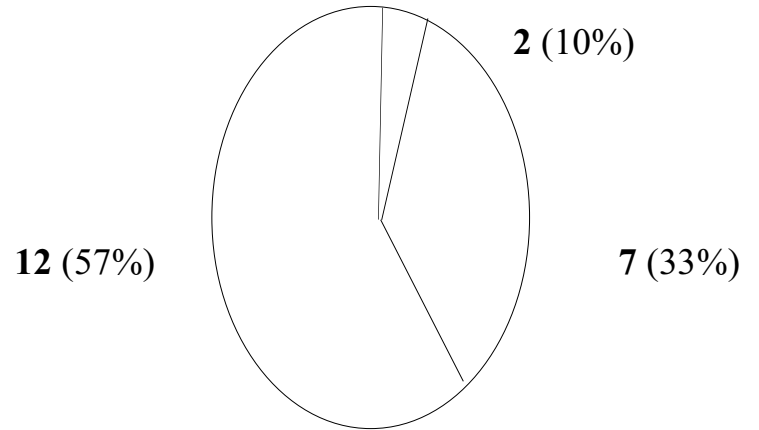
$$360 \times 0.25 = 90^{\circ}$$

$$360 \times 0.10 = \underline{36}^{\circ}$$

$$360^{\circ}$$

Finding Percent of a circle:

- ▶ 21 = 100% of the circle



Divide the sector's # by 21, then multiply by 100 to find the percentage of the sector.

$12 \div 21 = 0.571$	$0.57 \times 100 = 57\%$
$2 \div 21 = 0.095 * 0.1$	$0.10 \times 100 = 10\%$
$7 \div 21 = \underline{0.333...}$	$\underline{0.33} \times 100 = \underline{33\%}$
<hr/>	
21 0.999	$1.00 \times 100 = 100\%$