REARRANGING EQUATIONS

1.Expanding brackets (multiply by the number in front of the bracket) ALWAYS DO THIS FIRST

Adding/Subtracting → do one on each side

Multiplying/Dividing → do to every term

usually easier to do adding and subtracting before multiplying and dividing (you don't
have to follow BEDMAS for rearranging equations like you do for straight math)

Do the opposite of what is happening to x

$x + 3 = 8$

$-3 \quad -3$

$x = 5$

$x - 4 = 10$

$+4 \quad +4$

$x = 14$

$\frac{3x}{3} = \frac{12}{3}$

$x = 4$

$\frac{x}{2} \times 2 = 8 \times 3$

$x = 24$

$x < 4$ x is less than 4

$x > -3$ x is greater than -3

$x \leq 3/4$ x is less than or equal to 3/4

3/4 is a possible answer

$x \geq 5.4$ x is greater than or equal to 5.4

USE A NUMBER LINE TO SHOW THE ANSWER TO AN INEQUALITY

Hollow dots are for "greater than" and "less than"
Solid dots are for "greater than or equal to" or "less than or equal to"

You must use an arrow at the other end to show if it keeps going

a > 3

b ≤ -5

$-3 \leq x < 2$

change fractions to decimals to place them on the number line

d) $p < \frac{-25}{3}$ $\frac{-25}{3} = -8.3$

Answer: -9, -10, -11, -12, etc.

For word problems you need to ask yourself "are part values allowed?"
If not use dots instead of a full line

e). You must have 10 items of less to go to the express lane at the grocery store.

Answer: $x \leq 10$

f). Chantal's mom said she should invite at least 10 people to her birthday party.

Answer: $x \geq 10$

Solve inequalities the same way you solve equations EXCEPT change the sign if you multiply or divide by a negative number.

ex. solve and graph the following inequalities

$-5s \leq 25$

$\frac{-5s}{-5} \leq \frac{25}{-5}$

$s \geq -5$

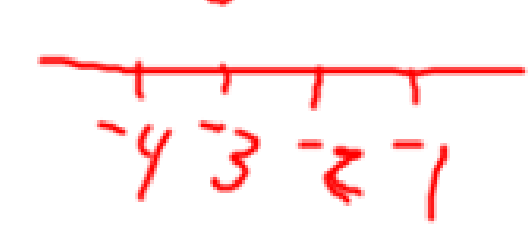
change sign

$7a < -21$

$\frac{7a}{7} < \frac{-21}{7}$

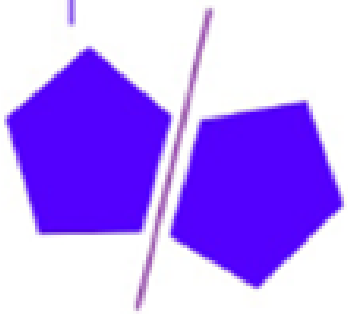
$a < -3$

don't change sign



Line of Symmetry

Line of Reflection



$$\text{ANGLE} = \frac{360^\circ}{\text{the order of rotation}}$$

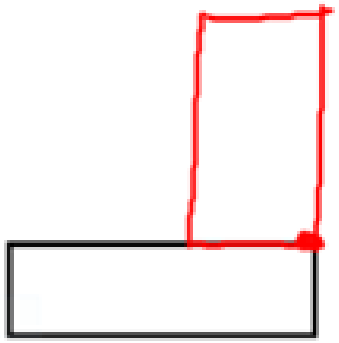
$$\text{ORDER} = \frac{360^0}{\text{Angle of rotational symmetry}}$$

Order of Rotation — The amount of times a shape matches up as it is rotated 360°

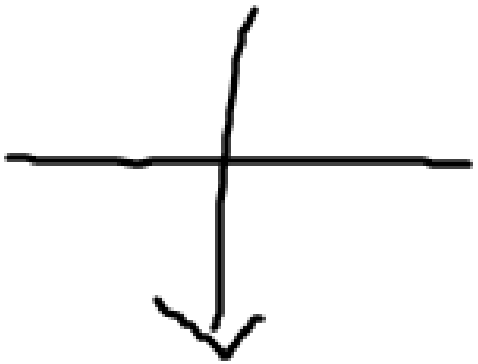
$$\text{Scale Factor} = \frac{\text{New}}{\text{Original}}$$

If the scale factor is greater than 1 its an enlargement
If the scale factor is less than 1 its a reduction

ORIGINAL X SCALE FACTOR = NEW



90° clockwise



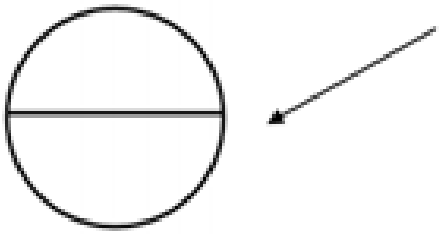
Corresponding sides: matching sides from the original and the new drawing.
Ex the bottom of both (ex. between angle A and angle B on both)

When ALL THE CORRESPONDING SIDES have the same scale factor then we can say the SIDES ARE PROPORTIONAL

Similar = sames shape but different size
(enlarged or reduced)

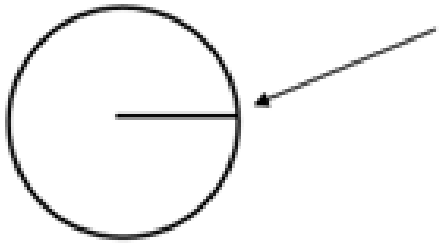
Similar Polygons: Matching angles are equal AND Matching sides are proportional (they all relate with the same scale factor)

TRIANGLES: if the angles are the same it guarantees the sides will be proportional. If the sides are proportional it guarantees the angles will be the same. Not true of squares/other shapes.



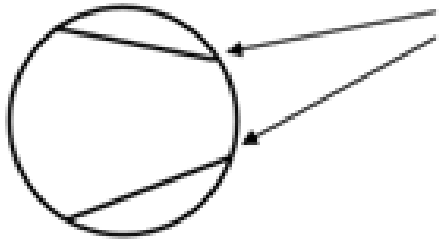
Diameter

the distance across a circle, measured through its center; or the line segment that joins two points on the circle and passes through the center.



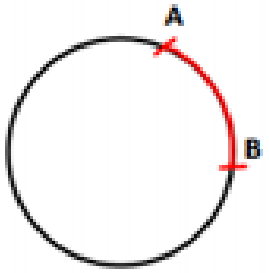
Radius

the distance or line segment from the center of a circle to any point on the circle.



Chord(s)

a line segment that joins two points on a circle.

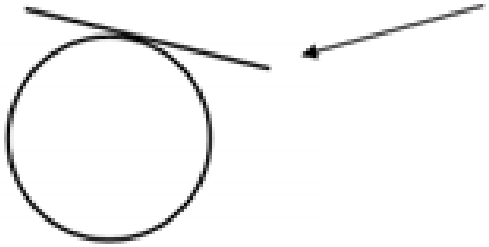


Arc

A segment of the circumference of a circle.

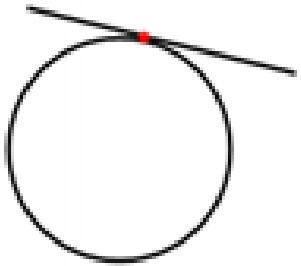
Minor Arc

The shorter of two arcs between two points on a circle.
For example: $\overset{\frown}{AB}$



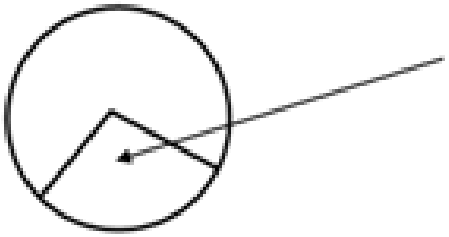
Tangent

a line that intersects a circle at only one point.



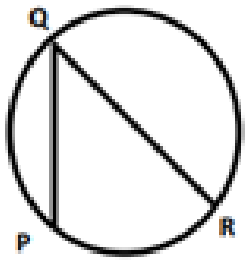
Point of Tangency

the point where a tangent intersects a circle



Central Angle

An angle whose arms are radii of a circle.

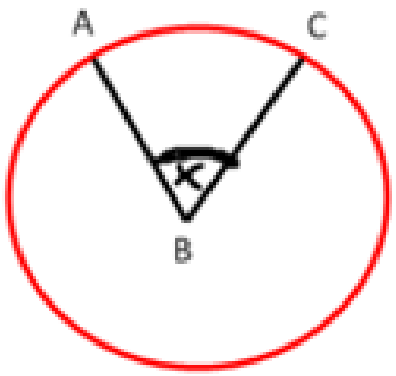


Inscribed Angle

An angle in a circle with its vertex and endpoints of its arms on the circle.

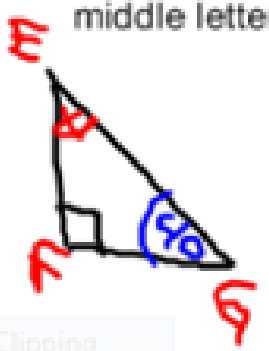
For example, $\angle PQR$

NAMING AN ANGLE



∠ABC

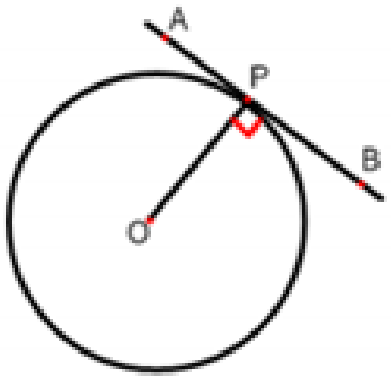
middle letter is always where the angle actually is so this angle would be angle ABC



∠EFG = 90°

∠EGF = 40°

∠GEF = x°



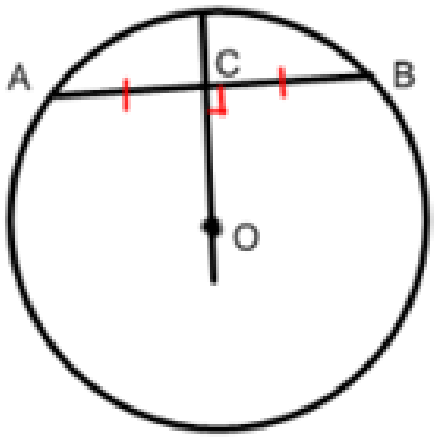
Tangent-Radius Property

A tangent to a circle is perpendicular to the radius at the point of tangency.

$\angle$ **APO** = $\angle$ **BPO** = 90^0

In any circle with center O and chord AB:

- If OC bisects AB, then OC $\perp$ AB
- If OC $\perp$ AB, then AC = CB
- The perpendicular bisector of AB goes through the center O.



Remember:

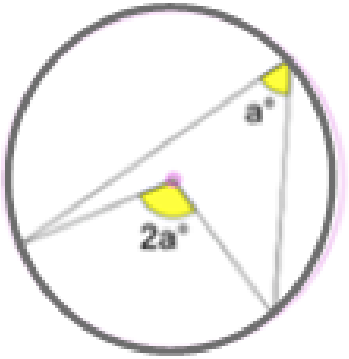
$\perp$ **Perpendicular** means there is a 90^o angle.

Bisector means it is divided into 2 equal parts

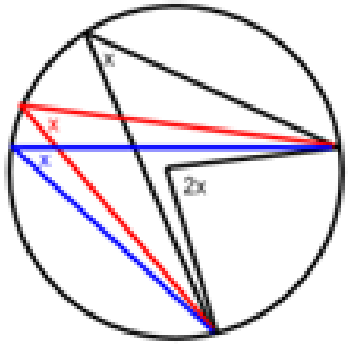
If AC = 10cm, then BC =10cm

Central Angle and Inscribed Angle Property

The measure of a central angle is twice the measure of an inscribed angle subtended by the same arc.

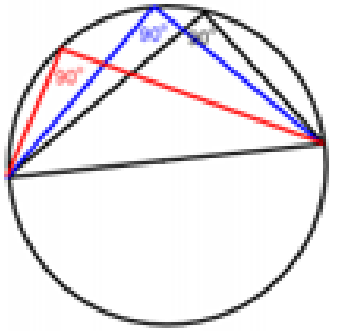


Inscribed angles subtended by the same arc are equal.



Angles in a Semicircle Property

Inscribed angles subtended by a semicircle (half the circle) are right angles. This means these angles use the diameter.



Always use 4 decimal places
while doing your work
and round final answers
to 2 decimal places.