New PIONEERS GRADED MATHS

H

Rasha Al-Shafee

Verified by: *Dr. Ibrahim Nofal*

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Points, Lines, and Line Segments

Basic terms:

- Points: We may think of a point as a "dot" on a piece of paper. We name this point with a letter. A point has no length or width.It just specifics an exact location. The following is a diagram of points A, B, C, and D

.A .B

.C .D

-Lines: We may think of a line as a "straight" line that we might draw with a ruler on a piece of paper, except in geometry, a line extends forever in both directions. We write th name of a line passing through two different points A and B as "Line AB" or a AB, the two-headed arrow over AB signifying a line passing through points A and B. (You can call it line BA) The following is a diagram of two lines: line AB ($\overleftrightarrow{AB}$) and line CD ($\overleftrightarrow{CD}$).

The arrows show that the lines drawn extend indefinitely in each direction

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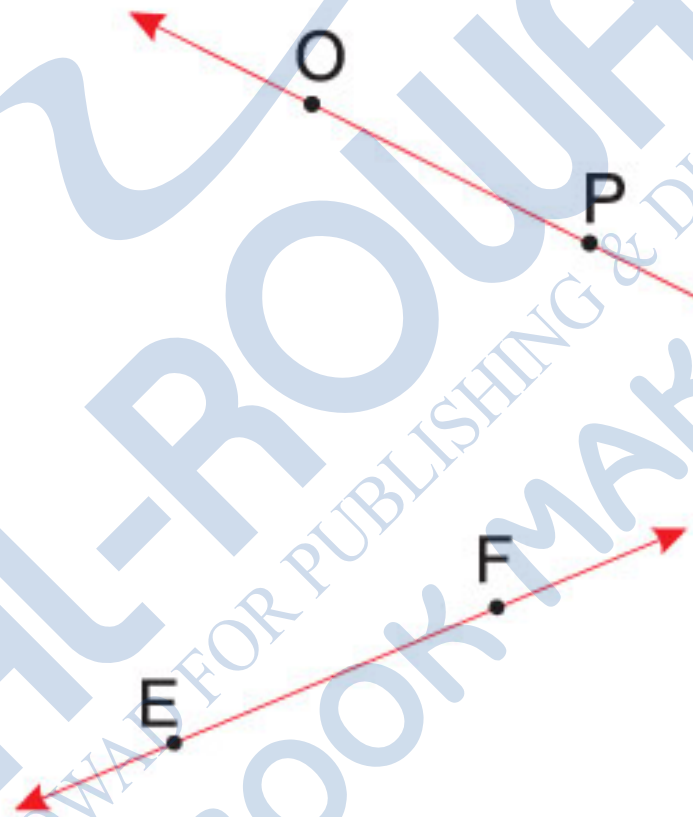
- Line Segments: We may think of a line segment as a "straight" line that we might draw with a ruler on a piece of paper A line segment does not extend forever, but has two endpoints A and B as "line segment AB" or as AB.
Note there are no arrow heads as with lines.

The following is a diagram of two line segments: line segment EF and line segment OP (or simply segment EF and segment OP).



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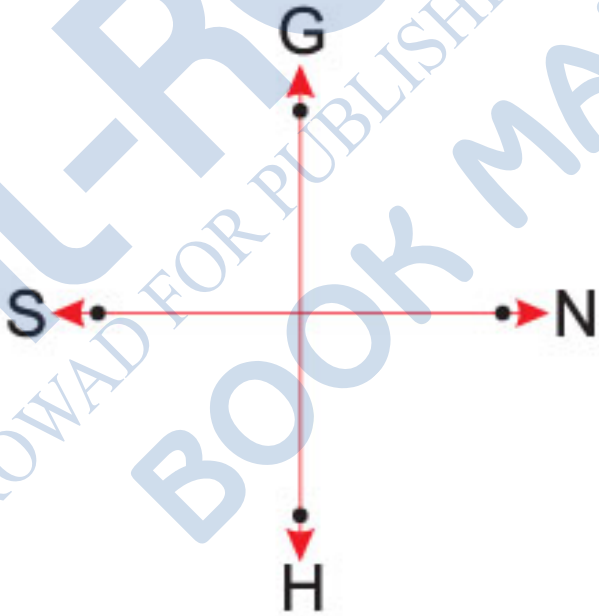
- Intersecting Lines: When two lines meet and share a common point (called the point of intersection), we call them intersecting lines. In the diagram below, line AB and line MS intersect at point T.

-Parallel lines: We say two lines are parallel when they never intersect.
In the diagram below line MN and line GH are parallel.

We write this as line **MN** line **GH**.

- Perpendicular Lines: Lines that intersect at right angles are perpendicular lines.
The following lines below are perpendicular lines.



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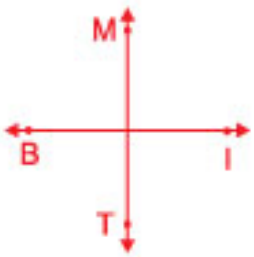
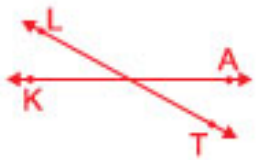
Use words and symbols to name each figure.

Write parallel, intersecting, or perpendicular to best describe the relationship between each pair of lines.





Think

Draw an example of two parallel lines that are intersected by one perpendicular line.

Show your work

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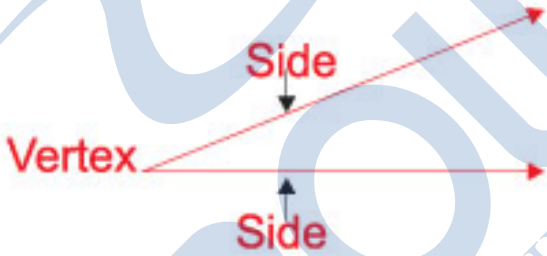
Rays:

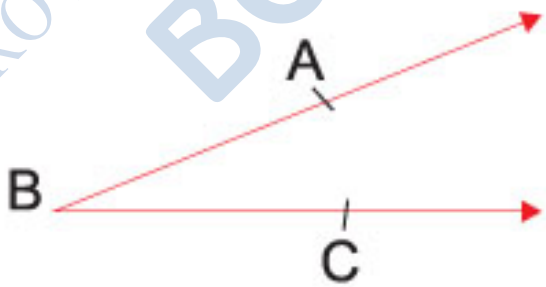
A ray a beginning point but no endpoint.
Think of sunrays: they start at the sun and go on forever.

Rays of the sun

-Angles: An angle is made up from two rays that have the same beginning points. That point is called the vertex and the two rays called the sides of the angle.



You can think of the two sides as having started side by side and have opened up to a certain point.
Remember that an angle is named using the letters, where the middle letter corresponds to the vertex of the angle.
The angle at the right is ABC or CBA or ∠B.



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Types of Angles:

-Acute Angle: whose measure is less than 90

-A-Right Angle: whose measure is 90

-An Obtuse Angle: whose measure is more than 90 but less than180.

-A straight Angle: whose measure is 180.

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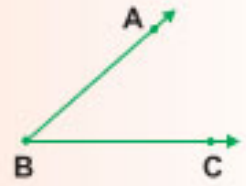
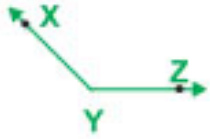
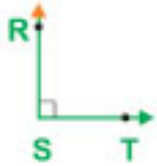
Name each angle in three ways. Then classify the angle as acute, obtuse, right, or straight.



$\angle B$, $\angle ABC$
$\angle CBA$

The angle is acute.





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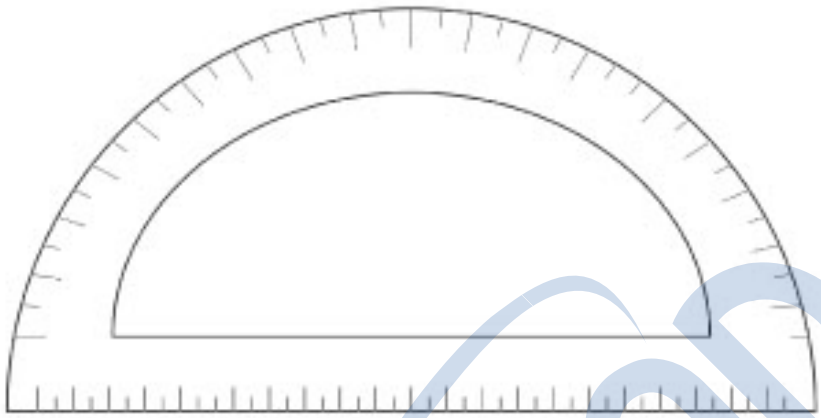
Measure Angles

Use a protractor to draw an angle having each measure. Then classify the angle as right, acute, obtuse, or straight.



60°

Draw a ray. Place the center mark of the protractor on the endpoint of the ray. Align the 0 mark ray Draw a ray from the vertex through the point for 60°.

90°

180°

130°

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Quadrilaterals and Other Polygons

. A polygon is a plane shape bounded by a closed path of three or more straight line segments. All the following shapes are polygons.

. A quadrilateral is a polygon with four sides.

. If the quadrilateral has opposite sides parallelogram are equal, it is a rhombus.

. If all the sides of a parallelogram are equal, it is a rhombus.

. We can say that a rhombus is also

- a polygon
- a quadrilateral
- a parallelogram.

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. If two sides of a quadrilateral are paralleled, it is a trapezium.

. If a polygon has four sides it is a pentagon

. If a polygon has eight sides it is an octagon.

. If all the sides and all angles of a polygon are equal it is a regular polygon, if not it is irregular this is a regular this is a regular pentagon.

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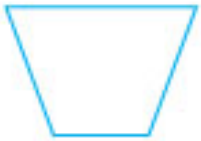
Quadrilaterals and Other Polygons

Name each Polygon. If the Polygon is a quadrilateral, write all names that apply.



Tell if each figure is a Polygon or not. For a Polygon, tell if it appears to be regular or irregular.

Think

Sami drew a shape with four sides. Two of the sides were parallel. The other two sides were not parallel. What kind of shape did Sami draw?

Show your work

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Classify Triangles

1. If the triangle has 2 sides of equal length, it is **isosceles**.
2. If the triangle has 3 sides of unequal length, **it is scalene**.
3. If the triangle has 1 obtuse angle **it is obtuse**.
4. If the triangle has 3 sides of equal length, it is **equilateral**.
5. If the triangle has 1 right angle, it is **right**.
6. If the triangle has 1 acute angles, it is **acute**.

Classify each triangle as equilateral, isosceles, or scalene and as right, obtuse, or acute.

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