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Geometry Journey Video Series

Program #6

Polygons

Satellite Broadcasting
VHS
and Internet/Intranet Streaming

Topic Page

Program Description

Polygons are used in nearly everything mankind builds, forming the basis for many structures, games and pastimes. This video is designed to help students easily visualize how to classify polygons into different major types as well as the distinct properties of each type, including quadrilaterals (the rectangle, square, parallelogram, rhombus and trapezoid) and regular polygons.

This program is the #6 episode in the fifteen 15-minute Geometry Journey Series.

Synopsis

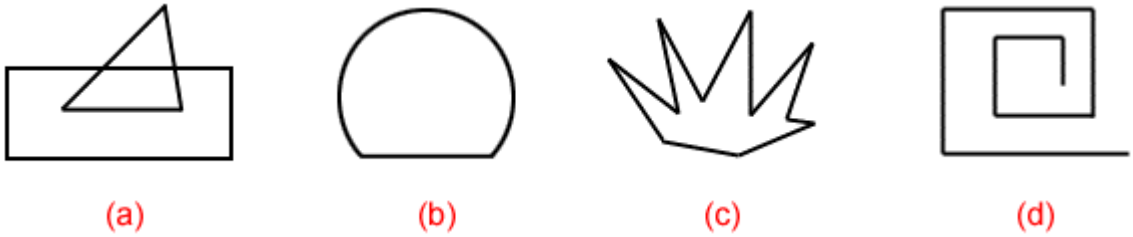
This program will cover the following topics:

1. Introduction to Polygons
2. Quadrilaterals
3. Types of Quadrilaterals
    a) Parallelogram
    b) Rectangle
    c) Rhombus
    d) Square
    e) Trapezoid

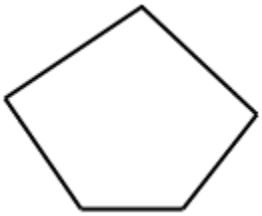
Geometry Journey Series
Program #6 - Polygons

Student Worksheet
Name _____

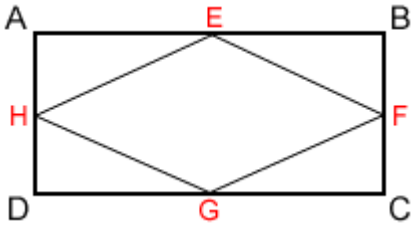
1) Decide which figures are polygons. If they are not, explain why.



2) Calculate the sum of the measures of the interior angles of the following convex pentagon.



3) Prove that the quadrilateral formed by joining the midpoints of a rectangle is a rhombus.

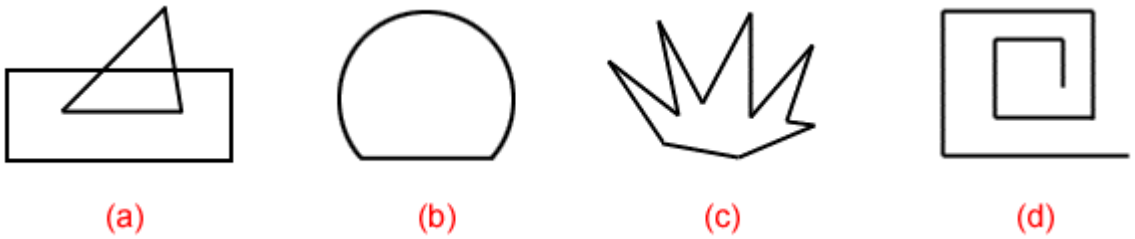


Discussion Questions

Question: Is it true that every square is a rectangle, a rhombus, and a parallelogram?

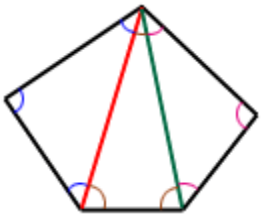
Answers to the Student Worksheet

1) Decide which figures are polygons. If they are not, explain why.



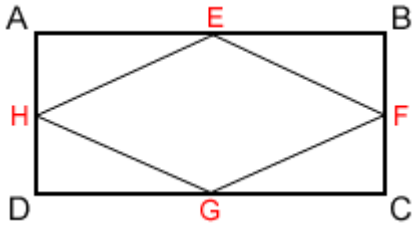
(a) It is not a polygon because some sides meet more than two other sides at positions other than their endpoints.
(b) It is not a polygon because one of its sides is not a line segment.
(c) It is a polygon.
(d) It is not a polygon because it is not a closed figure.

2) Calculate the sum of the measures of the interior angles of the following convex pentagon.



Answer: The sum of the measures of the interior angles of the above convex pentagon is equal to the sum of the measures of the interior angles of the three triangles. Therefore, it is equal to $3x180^{o}$, which is 540^{o}.

3) Prove that the quadrilateral formed by joining the midpoints of a rectangle is a rhombus.



Answer: In order to prove that EFGH is a rhombus, we need to show EF=FG=GH=HE.

Since AE=BE=CG=DG (midpoints), AH=BF=CF=DH and $\angle A=\angle B=\angle C=\angle D=90^{o}$, triangles AEH, BEF, CGF and DGH are congruent (Side-Angle-Side). Therefore, we have EF=FG=GH=HE. Hence, EFGH is a rhombus.

Hints to Discussion Questions

Question: Is it true that every square is a rectangle, a rhombus, and a parallelogram?

Hints: A square is a quadrilateral with four right angles and four congruent sides. Since a square has four right angles, it is also a rectangle. Because it has four congruent sides, it is also a rhombus. In addition, a square has two pairs of parallel sides, so it is also a parallelogram.

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