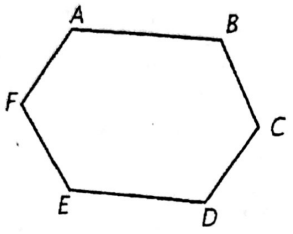
Regular Polygons

Lesson 37

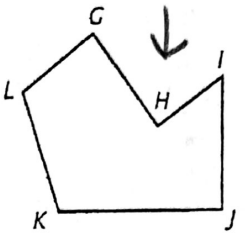
1. Classify each polygon as convex or concave. Explain why.

a)



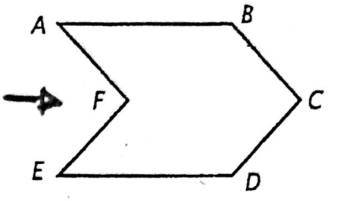
convex

b)



concave.

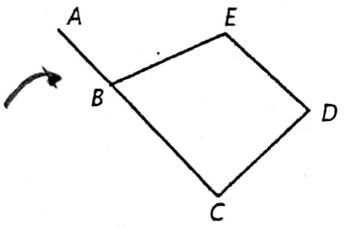
c)



concave.

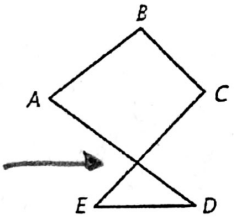
2. Circle the figures that are not polygons. Explain.

a)



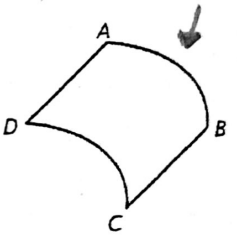
NOT

b)



NOT

c)

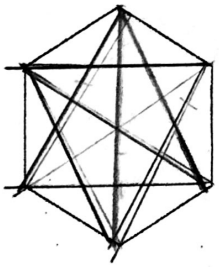


NOT

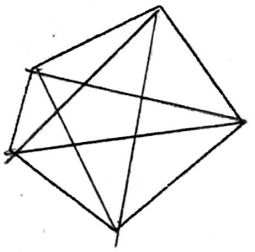
3. Draw the diagonals of each polygon.

a) $\frac{1}{2}(6)(6-3)$

$\frac{1}{2} \times 6 \times 3 = 9$

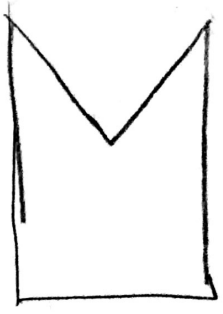


b) $\frac{1}{2} 5(5-3) = 5$

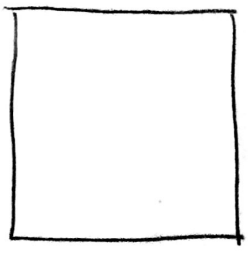


4. Sketch each polygon.

a) A concave pentagon.



b) A convex quadrilateral.



Lesson 37

5. True or False?

a) The only polygon with no diagonal is a triangle. T.

b) The sum of the interior angles of a pentagon is greater than that of a hexagon. F.

c) In a convex polygon, one angle must be greater than 180°. F.

d) In a convex polygon, the sum of the interior and exterior angles at each vertex is 180°. T.

e) It is possible to construct a concave triangle. F.

6. Give the sum of the interior angles for: $(n-2)(180)$

a) A pentagon: 540°. $(5-2)(180)$ b) An octagon: 1080°. $(8-2)$ c) A square: 360°. $(4-2)(180)$

7. Calculate the number of sides in a polygon if the sum of the interior angles is:
(Use the guess and check "formula" backwards. Ex: (n - 2)180 = *interior angle*)

a) 1980° 13.

b) 3060° 19.

c) 2160° 14.

a) $\frac{1980}{180} = \frac{(n-2)(180)}{180}$

$11 = n-2$

$11+2 = n$

$13 = n$

8. Name the polygon that has a maximum of: $n(n-3)\cdot\frac{1}{2}$

a) 20 diagonals. octagon $n=8$ b) 35 diagonals. decagon $n=10$ c) 9 diagonals. hexagon $n=6$

9. Give the sum of the interior angles for a polygon with: $(n-2)(180)$

a) 100 sides: 17 640. $(98)(180)$ b) 20 sides: 3240. $(18)(180)$ c) 12 sides: 1 800. $(10)(180)$

10. How many diagonals can be drawn in a polygon with:

a) 12 sides? 54 diagonals $\frac{n(n-3)}{2}$

b) 10 sides? 35 diagonals $= \frac{12(12-3)}{2}$

c) 7 sides? 14 diagonals

#8a

$20 = \frac{n(n-3)}{2}$

$40 = n(n-3)$ in Sec 2 trial & error

$n=7$ $(7)(7-3)=28$ ×

$n=8$ $(8)(8-3)=40$ ✓