Practice #12 Geo Angles in Regular Polygons Tuesday, March 31, 2020

Round to the nearest hundredth where necessary.

1. Find the sum of the interior angles of each polygon.

a) Nonagon (9-sides).

b) 20-gon.

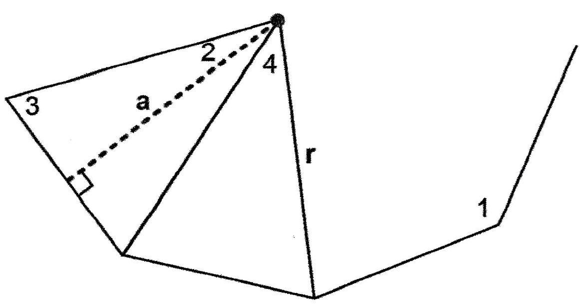
2. Find the measure of one interior angle of each regular polygon.

a) Octagon.

b) 16-gon

Find the measure of each numbered angle in each. The figures shown may be just part of the given Regular Polygon.

3. Dodecagon (12-sides)



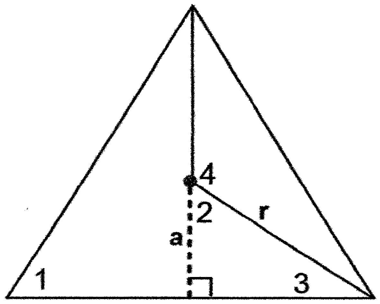
$\angle 1 =$

$\angle 2 =$

$\angle 3 =$

$\angle 4 =$

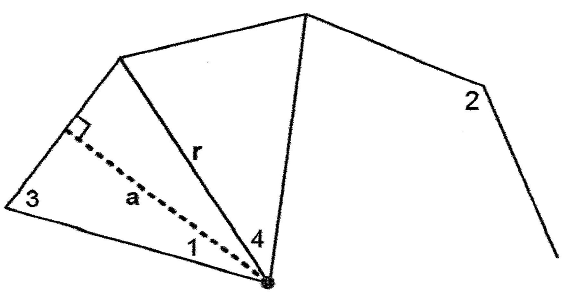
4. Equilateral Triangle



$\angle 1 =$ $\angle 2 =$

$\angle 3 =$ $\angle 4 =$

5. 18-gon.



$\angle 1 =$ $\angle 2 =$

$\angle 3 =$ $\angle 4 =$

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Round to the nearest hundredth where necessary.

ANSWERS

1. Find the sum of the interior angles of each polygon.

a) Nonagon (9-sides).

$n = 9$

$\text{sum} = (9-2)\cdot 180$

$\boxed{\text{sum} = 1260°}$

b) 20-gon.

$n = 20$

$\text{sum} = (20-2)\cdot 180$

$\boxed{\text{sum} = 3240°}$

2. Find the measure of one interior angle of each regular polygon.

a) Octagon. $n = 8$

• 1st find sum of all interior ∠s:

$\text{sum} = (8-2)\cdot 180 = 1080°$

• 2nd now find measure of one interior ∠:

$1 \text{ int } \angle = \frac{1080}{8} = 135°$

b) 16-gon $n = 16$

• 1st find sum of all int. ∠s:

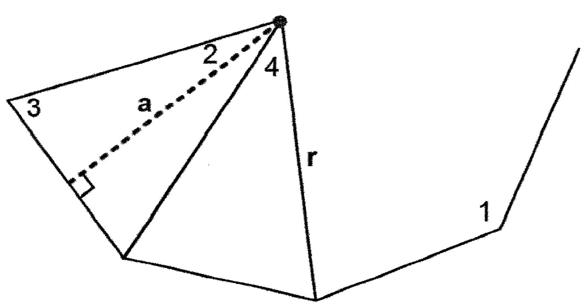
$\text{sum} = (16-2)\cdot 180$
$= 2520°$

• 2nd find 1 int ∠:

$1 \text{ int } \angle = \frac{2520°}{16} = \boxed{157.5°}$

Find the measure of each numbered angle in each. The figures shown may be just part of the given Regular Polygon.

3. Dodecagon (12-sides)



$\angle 1 =$ 150° $\angle 2 =$ 15°

$\angle 3 =$ 75° $\angle 4 =$ 30°

∠1 $\text{sum int } \angle s = (12-2)\cdot 180 = 1800°$

$1 \text{ int } \angle = \frac{1800}{12} = 150°$

$\boxed{\angle 1 = 150°}$

∠4 one central $\angle = \frac{360}{n}$

$= \frac{360}{12} = 30°$

$\boxed{\angle 4 = 30°}$

∠2 $\angle 2 = \angle 4 \div 2$

$= 30 \div 2$

$\boxed{\angle 2 = 15°}$

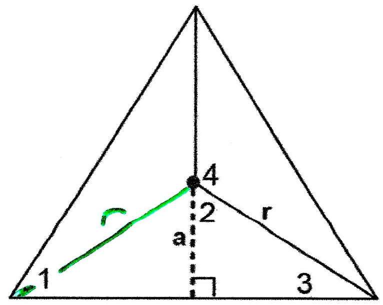
∠3 several ways to find ∠3.

$\angle 3 = \angle 1 \div 2 = 150° \div 2$

$\boxed{\angle 3 = 75°}$

or $\angle 3 = 180 - 90 - \angle 2$

4. Equilateral Triangle



$\angle 1 =$ 60° $\angle 2 =$ 60°

$\angle 3 =$ 30° $\angle 4 =$ 120°

$\underline{\underline{\angle 1}}$: sum int $\angle$s of a $\Delta = 180°$

$\angle 1 = 1 \text{ int } \angle = \frac{180}{3}$

$\boxed{\angle 1 = 60°}$

$\underline{\underline{\angle 4}}$: $\angle 4 = \frac{360°}{3}$ $\boxed{\angle 4 = 120°}$

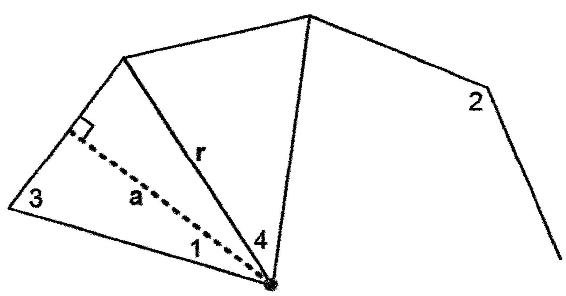
$\underline{\underline{\angle 2}}$: $\angle 2 = \angle 4 \div 2 = 120° \div 2$

$\boxed{\angle 2 = 60°}$

$\underline{\underline{\angle 3}}$: $\angle 3 = \angle 1 \div 2 = 60 \div 2$

$\boxed{\angle 3 = 30°}$

5. 18-gon.



$\angle 1 =$ 10° $\angle 2 =$ 180°

$\angle 3 =$ 80° $\angle 4 =$ 20°

$\underline{\underline{\angle 2}}$: sum int $\angle$s $= (18-2)(180)$

$= 2880°$

$\angle 2 = 1 \text{ int } \angle = \frac{2880°}{18}$

$\boxed{\angle 2 = 160°}$

$\underline{\underline{\angle 4}}$: $\frac{360°}{18} \rightarrow \boxed{\angle 4 = 20°}$

$\underline{\underline{\angle 1}} = \angle 4 \div 2 = 20° \div 2$

$\boxed{\angle 1 = 10°}$

$\underline{\underline{\angle 3}}$: $\angle 3 = \angle 2 \div 2 = 160° \div 2$

$\boxed{\angle 3 = 80°}$