

Math 114
Geometry Assignment #3

Section 2.3
Problems 7, 8, 9, 11, 13, 15, 17, 27, 29

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**graphical figures omitted*

7.) The measures of two angles in a triangle are given. Find the missing measure of the angle.

a.) 90° , 60°

30°

b.) 120° , 40°

20°

c.) 85° , 33°

62°

d.) 79° , 67°

34°

8.) The measures of $\angle A$, $\angle B$, $\angle C$ are given. Can you make a triangle $\triangle ABC$ with the given angle measures? Explain.

a.) $\angle A = 36^\circ, \angle B = 70^\circ, \angle C = 66^\circ$

Yes, because $36 + 78 + 66 = 180$

a.) $\angle A = 124^\circ, \angle B = 56^\circ, \angle C = 20^\circ$

No, because $124 + 56 + 20 \neq 180$

a.) $\angle A = 36^\circ, \angle B = 70^\circ, \angle C = 66^\circ$

No, because $90 + 74 + 18 \neq 180$

9.) Calculate the measure of each lettered angle. Congruent angles and right angles are indicated.

$\angle A = 70^\circ, \angle B = 130^\circ, \angle C = 120^\circ, \angle D = 20^\circ, \angle E = 20^\circ, \angle F = 80^\circ, \angle G = 60^\circ, \angle H = 100^\circ$

11.) Find the missing angle measures in the quadrilaterals shown.

a.)

98°

b.)

125°

c.)

120°

d.)

$4x - 20 = 360$

$x = 95$

$\therefore 80^\circ, 85^\circ, 95^\circ, 100^\circ$

13.) Suppose that the sum of the measures of the vertex angles of a polygon is $1,620^\circ$. How many sides does the polygon have?

$$\begin{aligned}
 (x - 2)180^\circ &= 1620^\circ \\
 \frac{(x-2)180^\circ}{180^\circ} &= \frac{1620^\circ}{180^\circ} \\
 x - 2 &= 9 \\
 \therefore x &\text{ has } \underline{11} \text{ sides}
 \end{aligned}$$

15.) What is the sum of the measures of the vertex angles of a 29-sided polygon.

$$\begin{aligned}
 (29 - 2)180^\circ &= x^\circ \\
 (27)180^\circ &= x^\circ \\
 \therefore x &\text{ is } \underline{4,860^\circ}
 \end{aligned}$$

17.) For the following regular n -gons, give the measure of a vertex angle.

a.) 12-gon

$$\frac{1800}{12} = 150^\circ$$

b.) 16-gon

$$\frac{2520}{16} = 157.5^\circ$$

c.) 10-gon

$$\frac{1440}{10} = 144^\circ$$

d.) 20-gon

$$\frac{3240}{20} = 162^\circ$$

e.) 18-gon

$$\frac{2880}{18} = 160^\circ$$

f.) 36-gon

$$\frac{6120}{36} = 170^\circ$$

27.) Verify that the measure of a vertex angle in a regular polygon.

# of sides & angles	# of triangle divisions	sum of angle measures	measure of angle
3	1	180°	60°
4	2	360°	90°
5	3	540°	108°
6	4	720°	120°
8	6	1,080°	135°
10	8	1,440°	144°
n	$n - 2$	$(n - 2)(180^\circ)$	$\frac{(n-2)180^\circ}{n}$

29.) From a plane at point A in the following picture, the angle of depression (*the acute angle between the horizontal and the line of sight*) to a control tower at point C is $20^\circ 35' 50''$, as shown. Find the measure of $\angle ACB$ in degrees, minutes, and seconds.

$$\begin{aligned}
20^\circ + \frac{35'}{60} + \frac{50''}{3600} &\implies 20.59^\circ \\
90^\circ - 20.59^\circ &\implies 69.41^\circ \\
69.41^\circ &\implies 69 + .4 \cdot 60 + .01 \cdot 3600 \\
\therefore \angle ACB &= 69^\circ 24' 36''
\end{aligned}$$