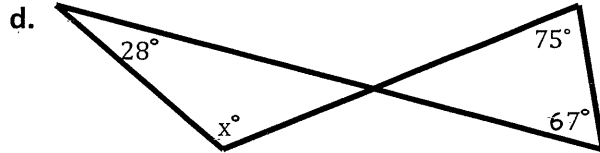Name: _____ Date: _____ `Period: _____
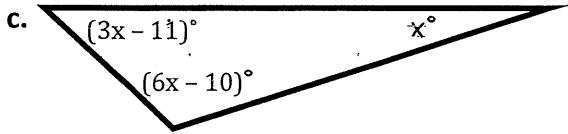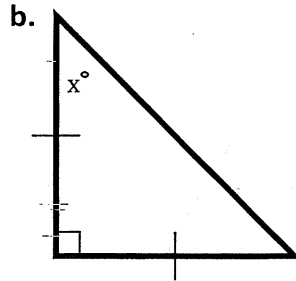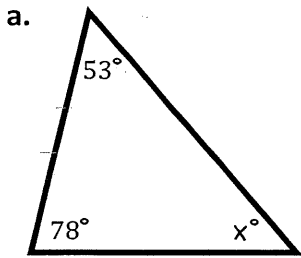
CCGPS Analytic Geometry

Notes: Interior and Exterior Angles of Triangles

Homework: Attached worksheet

Essential Question: What are the steps to finding the measure of interior and exterior angles of a polygon?
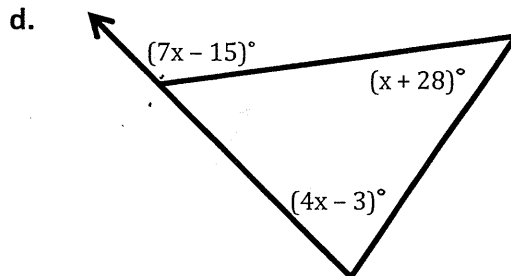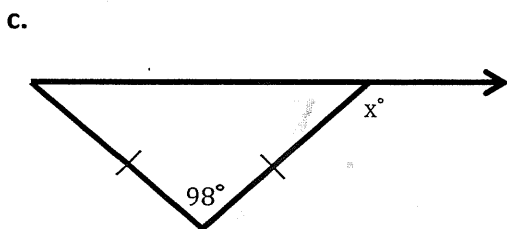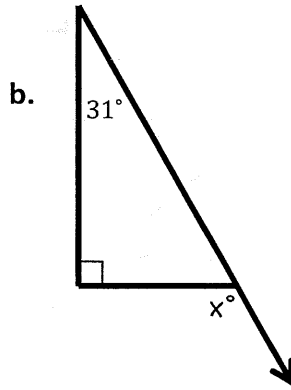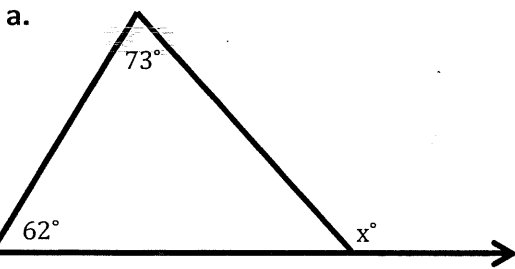
The **Triangle Angle Sum Theorem** states that the sum of the angles in a triangle is _____.

Examples: Find the value of x.

a.

53°
78°   x°

b.

x°

c.

(3x – 11)°   x°
(6x – 10)°

d.

28°   75°
x°   67°

The **Exterior Angle Theorem** states that the measure of an exterior angle of a triangle is _____ to the sum of the measures of the two non-adjacent interior angles.
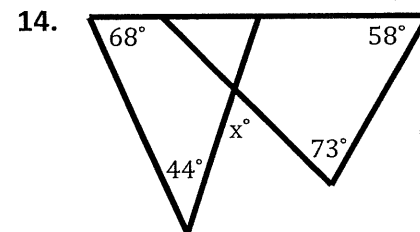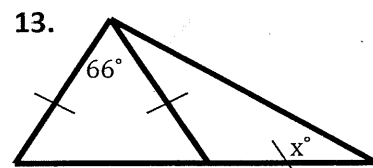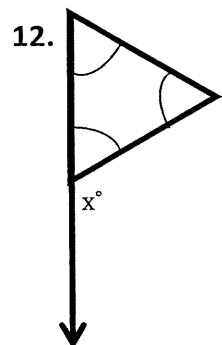
Examples: Find the value of x.
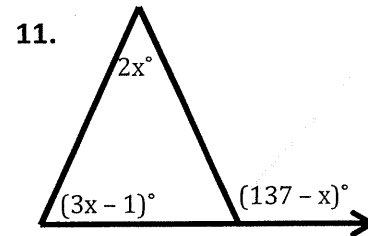
a.

73°
62°   x°

b.

31°

x°

c.

98°   x°

d.

(7x – 15)°
(x + 28)°
(4x – 3)°

Name: _____ Date: _____ `Period: _____

CCGPS Anlaytic Geometry
Homework: Interior and Exterior Angles of Triangles

Directions: Find the value of x.

1.

73°
42°
x°

2.

3x°
x°
2x°

3.

□ (2x – 8)°
(x – 7)°

4.

18°
x°
32°

5.

x°
x°   x°

6.

(2x + 5)°
(x + 17)°   (3x – 16)°

7.

x°
89°
40°
x°

8.

65°   80°
□   60°
x°

9.

x°
40°
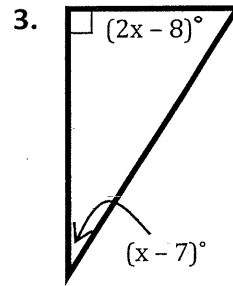
10.

118°
x°

11.

2x°
(3x – 1)°   (137 – x)°

12.

x°

13.

66°
x°

14.

68°   58°
x°   73°
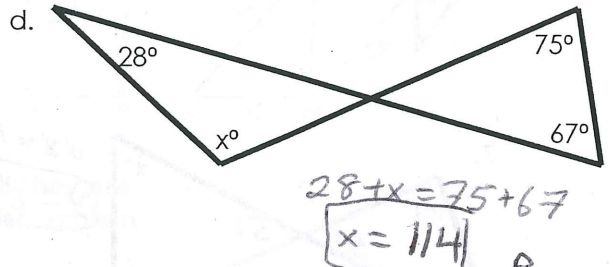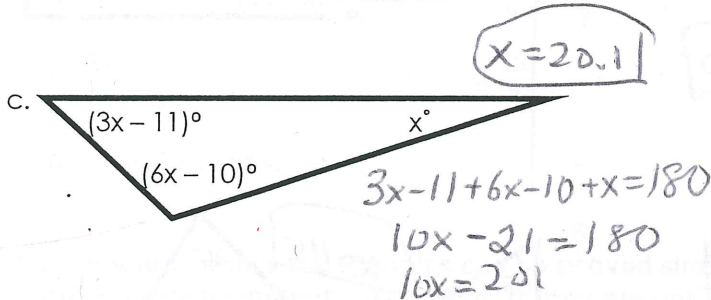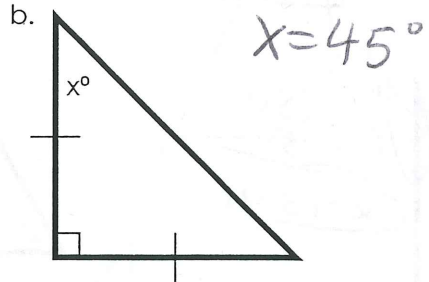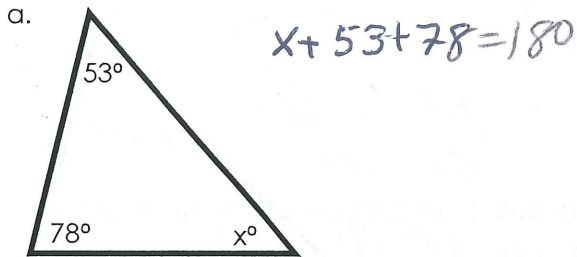44°

Name: **KEY**   Period: _____
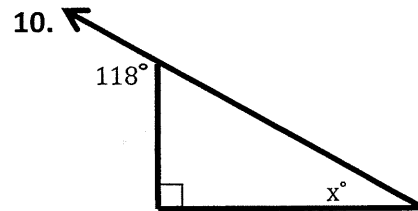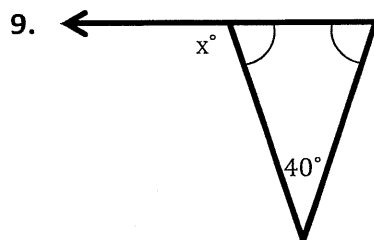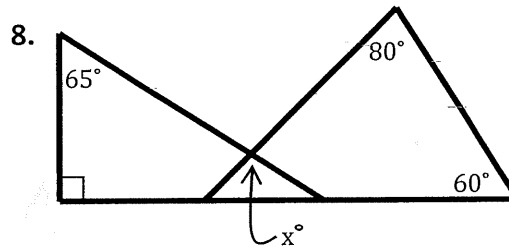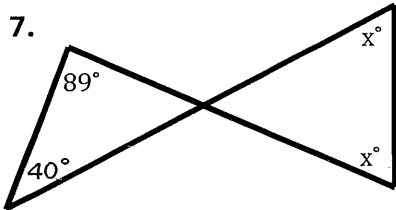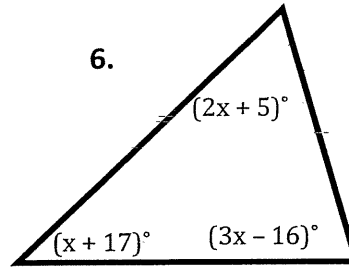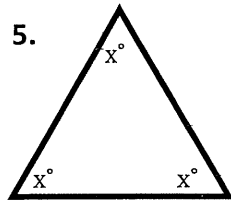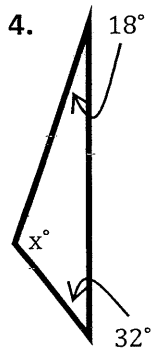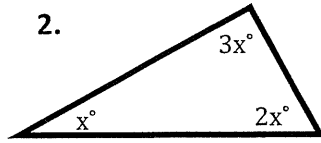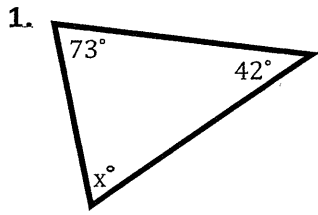
CCGPS Analytic Geometry
Interior and Exterior Angles of Triangles and Polygons
October 6th – 8th, 2014

<u>Essential Question:</u> What are the steps to finding the measure of interior and exterior angles of a polygon?

The ___*Triangle Sum Theorem*___ states that the sum of the angles in a triangle is ___$180°$___.

<u>Examples:</u> Find the value of x.

a.

$53°$

$78°$ $x°$

$x + 53 + 78 = 180$

b.

$x°$

$x = 45°$

$\boxed{x = 20.1}$

c.

$(3x - 11)°$ $x°$

$(6x - 10)°$

$3x - 11 + 6x - 10 + x = 180$
$10x - 21 = 180$
$10x = 201$

d.

$28°$ $75°$

$x°$ $67°$

$28 + x = 75 + 67$
$\boxed{x = 114}$

The ___*Exterior Angle Theorem*___ states that the measure of an exterior angle of a triangle is ___*equal*___ to the sum of the measures of the two non-adjacent interior angles.

$x = 62 + 73$
$\boxed{x = 135}$
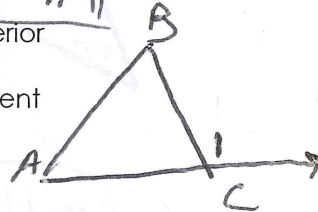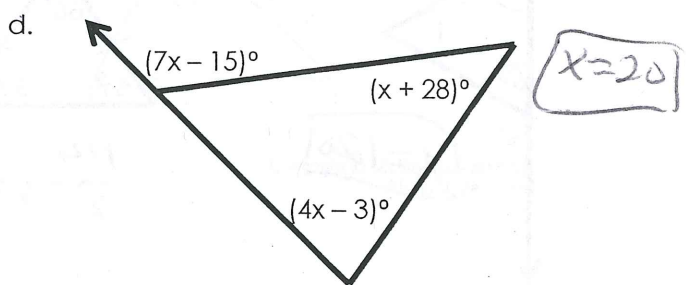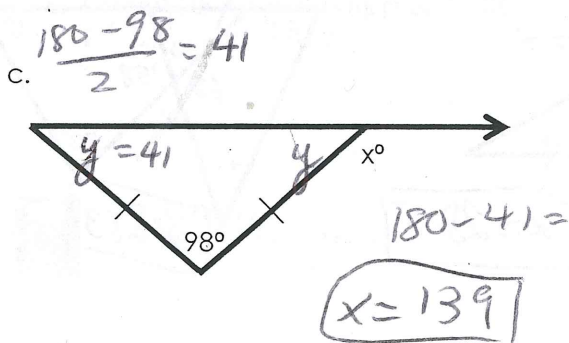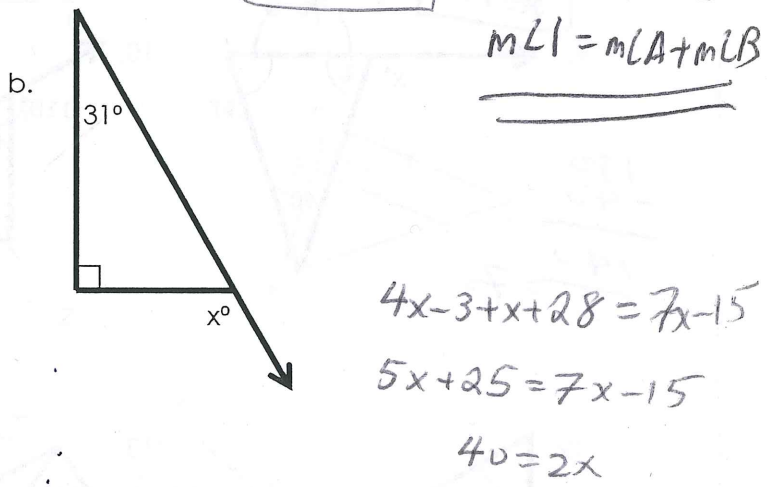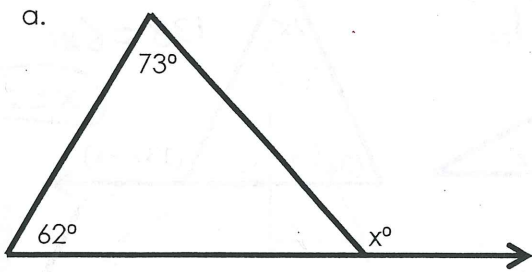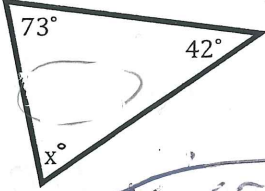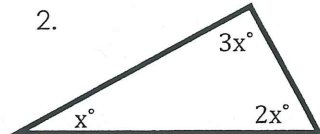
$\boxed{x = 121}$

B

A   1   C

$m\angle 1 = m\angle A + m\angle B$

<u>Examples:</u> Find the value of x.

a.

$73°$

$62°$ $x°$

$\dfrac{180 - 98}{2} = 41$

b.

$31°$

$x°$

$4x - 3 + x + 28 = 7x - 15$
$5x + 25 = 7x - 15$
$40 = 2x$

c.

$y = 41$ y $x°$

$98°$

$180 - 41 =$

$\boxed{x = 139}$

d.

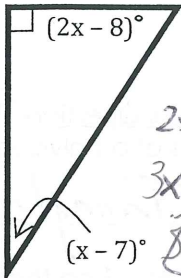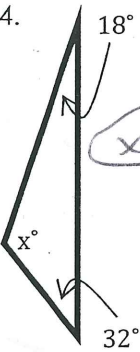$(7x - 15)°$ $(x + 28)°$

$(4x - 3)°$

$\boxed{x = 20}$

Interior and Exterior Angles of Triangles Practice

Directions: Find the value of x.

1.
73° 42°
x°
$x=65$

2.
3x°
x° 2x°
$6x=180$
$x=30$
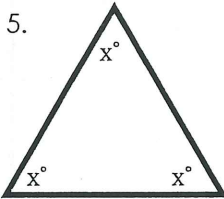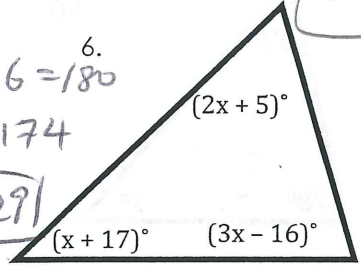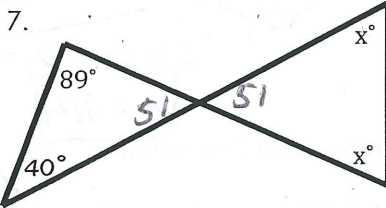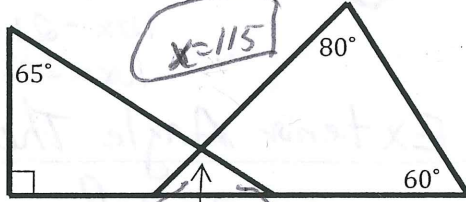
3.
□ (2x – 8)°
(x – 7)°
$2x-8+x-7=90$
$3x-15=90$
$3x=105$
$x=35°$
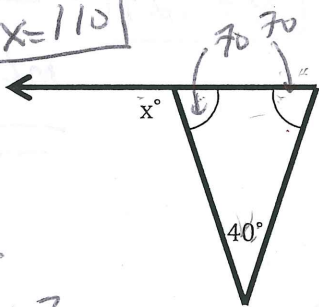
4.
18°
x°
32°
180
-50
$x=130$

5.
x°
x° x°
$x=60$

6.
$6x+6=180$
$6x=174$
$x=29$
(2x + 5)°
(x + 17)° (3x – 16)°

7.
x°
89° 51 51
40° x°
$2x=129$
$x=64.5$

8.
$x=115$
65° 80°
□ 60°
x° 25
40

9.
$x=110$
70 70
x°
40°
180
-40
140
$\frac{140}{2}=70$

10.
118°
62
x°
$x=28$
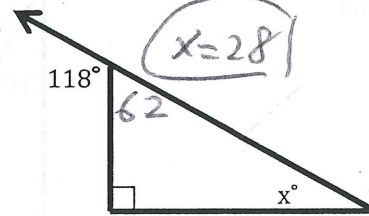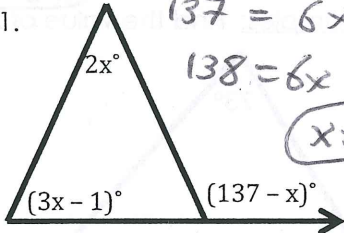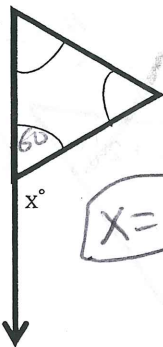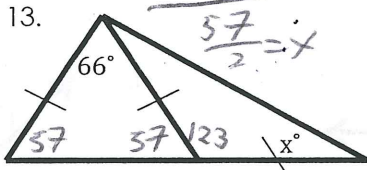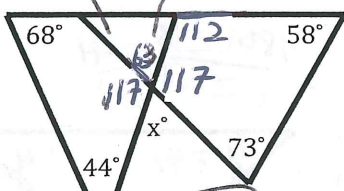
11.
2x°
(3x – 1)° (137 – x)°
$137-x=2x+3x-1$
$137=6x-1$
$138=6x$
$x=23$

12.
60
x°
$x=120$

13.
66°
57 57 123
x°
180
-123
$\frac{57}{2}=x$
$\frac{114}{2}=57$
$x=28.5$

14.
112 68
68° 112 58°
117 117
x°
44° 73°
$x=63$