Unit 16: Circle Theorems

Circle Theorem 1:

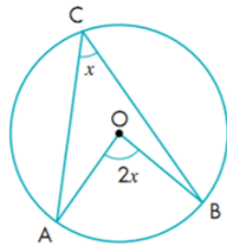"The angle at the centre of a circle is twice the angle at the circumference."

Angle AOB = 2 x ACB

$x = 2 \times 28$
$x = 56°$

a = 42°   a = 47°   b = 79°
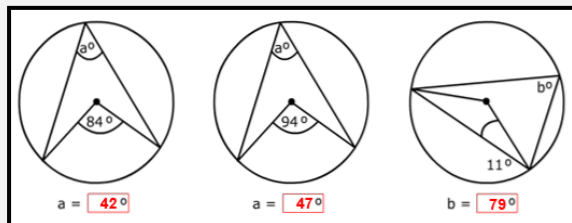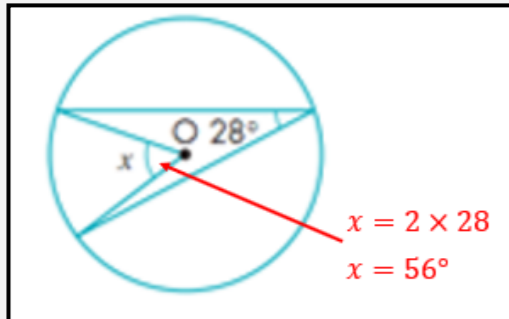
Circle Theorem 2:

"Every angle at the circumference of a semicircle that is subtended by the diameter of the semicircle is a right-angle."
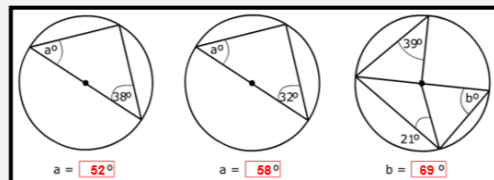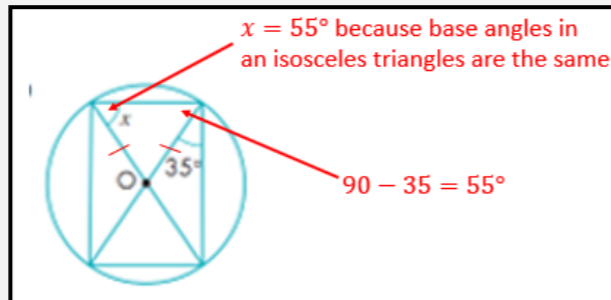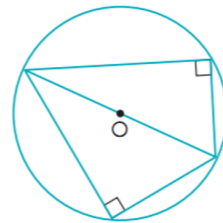
$x = 55°$ because base angles in an isosceles triangles are the same

$90 - 35 = 55°$

a = 52°   a = 58°   b = 69°

Circle Theorem 3:

"Angles subtended at the circumference in the same segment of a circle are equal."

Points C_1, C_2, C_3 and C_4 on the circumference are subtended by the same arc, AB.

Circle Theorem 2: Right angled triange

Angles in a triangle sum to 180°
90 + 60 = 150
180 − 150 = 30°

Circle theorem 3: Angles subtended at the circumference in the same segment of a circle are equal

a = 28°   c = 43°   e = 48°
b = 17°   d = 43°
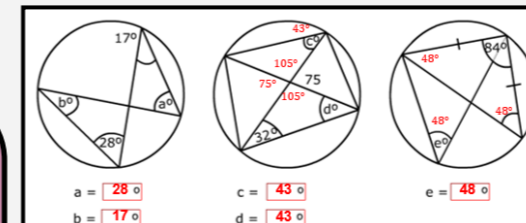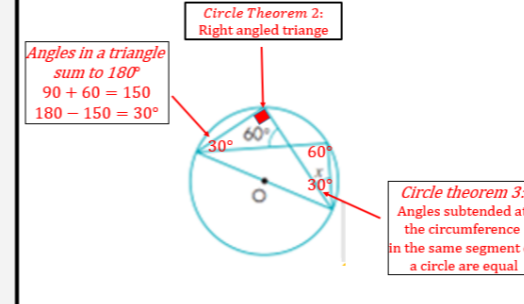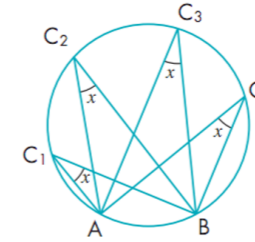
Circle Theorem 4:

"The sum of the opposite angles in a cyclic quadrilateral is 180°."

$a + c = 180°$ and $b + d = 180°$

Circle theorem 4: Opposite angles in a cyclic quadrilateral Sum to 180°

$180 - 74 = 106°$
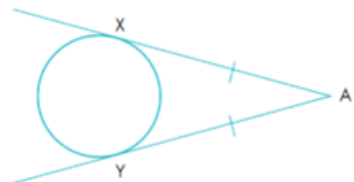$x = 106°$

Circle theorem 4

Circle theorem 1

Circle Theorem 5:

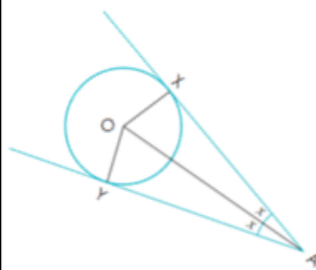"When a radius meets a tangent, it always makes a 90° angle."
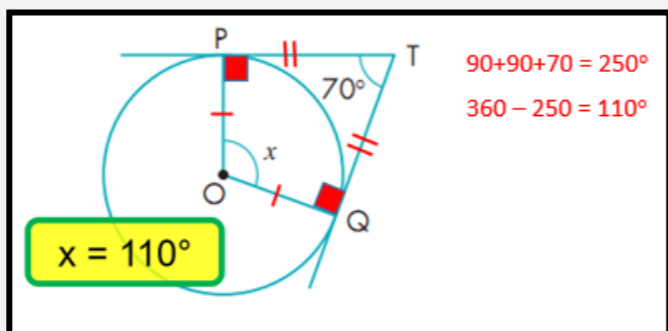
a = 4°
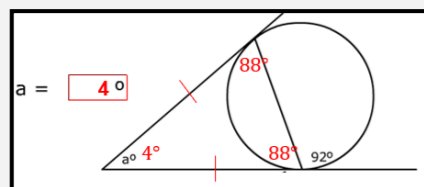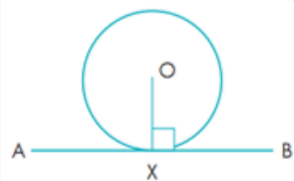
Circle Theorem 6:

"Tangents to a circle from an external point to the points of contact are equal in length."
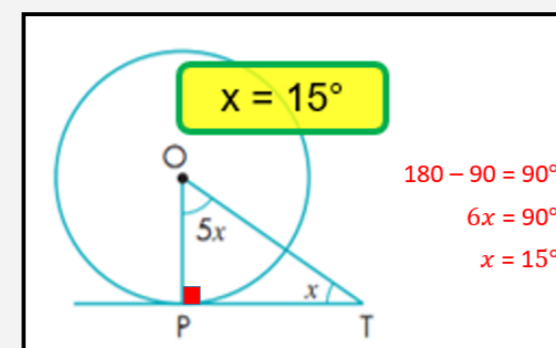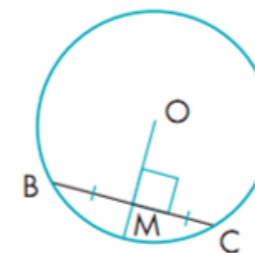
Circle Theorem 7:

"The line joining an external point to the centre of the circle bisects the angle between the tangents."

90+90+70 = 250°
360 − 250 = 110°

x = 110°

Circle Theorem 8:

"A radius bisects a chord at 90°."

If O is the centre of the circle, angle BMO = 90° and BM = CM.

x = 15°

$180 - 90 = 90°$
$6x = 90°$
$x = 15°$

Circle Theorem 9:

The Alternate Segment Theorem

"The angle between a tangent and a chord through the point of contact is equal to the angle in the alternate segment."

a = 35°
b = 77°