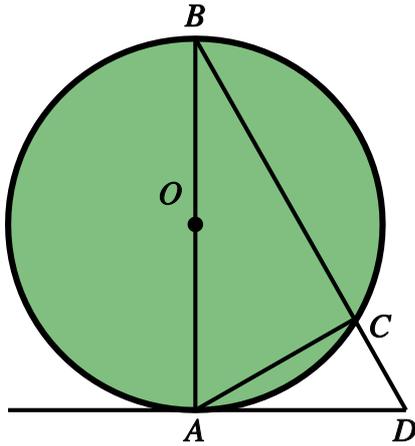


## Circle Theorems (advanced) - reasons required

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Mark / 8 %

1) In the diagram below, angle  $ABC = 42^\circ$ .



Find the following angles, giving reasons for your answers:

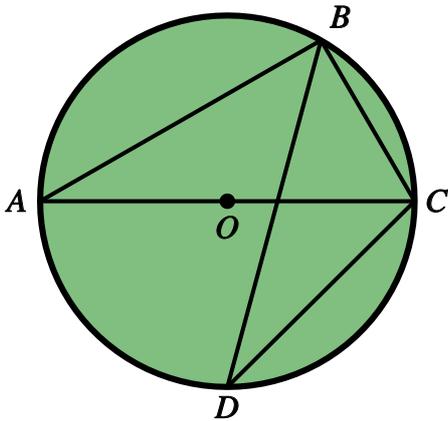
a) angle BAC

b) angle ADC

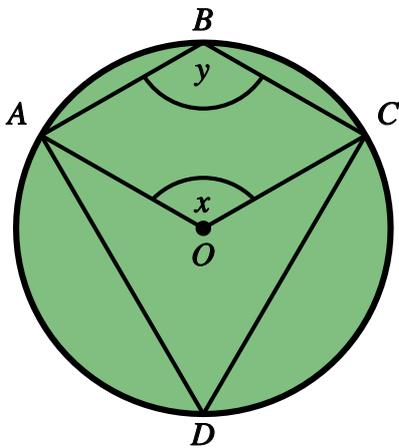
[1]

2) In the diagram below, angle  $ACB = 38^\circ$ .  
Find angle  $BDC$ , giving reasons for your answer.

[1]



3) In the diagram below, angle  $ADC = 39^\circ$ .



Find the following angles, giving reasons for your answers:

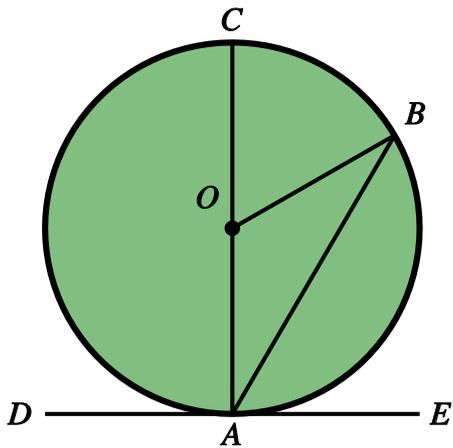
a) angle  $x$

b) angle  $y$

[1]

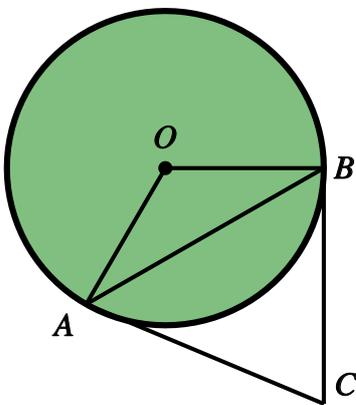
4) In the diagram below, angle  $BOC = 30^\circ$ .  
Find angle  $BAE$ , giving reasons for your answer.

[1]

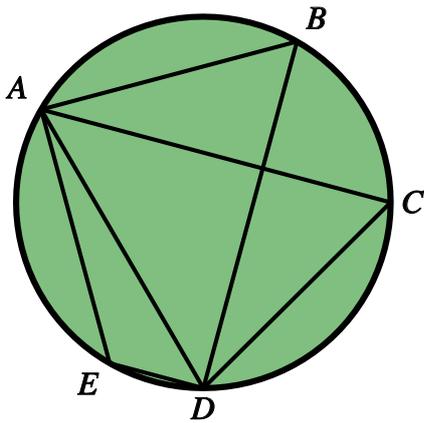


5)  $AB$  and  $BC$  are tangents to the circle shown below. Angle  $ACB = 52^\circ$ .  
Find angle  $OAB$ , giving reasons for your answer.

[1]



6) In the diagram below, angle  $ABD = 85^\circ$ .



Find the following angles, giving reasons for your answers:

a) angle  $ACD$

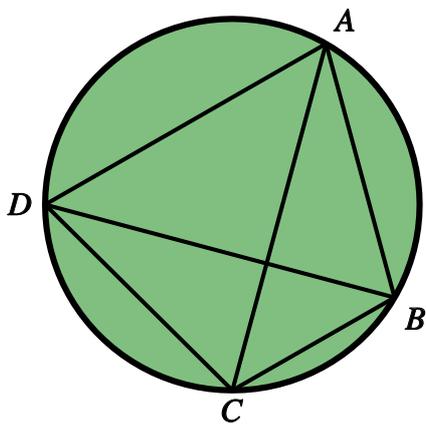
b) angle  $AED$

[1]

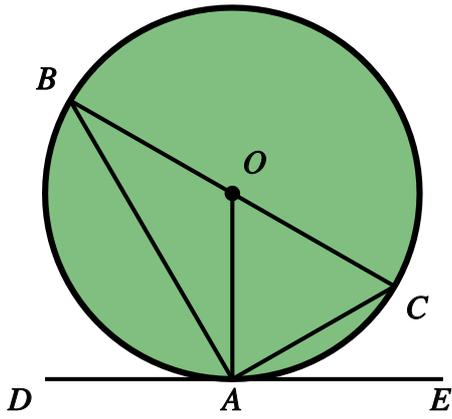
7) In the diagram below, angle  $ADC = 85^\circ$  and angle  $ACD = 39^\circ$ .

Find angle  $DBC$ , giving reasons for your answer.

[1]



8) In the diagram below, angle  $CAE = 25^\circ$ .



Find the following angles, giving reasons for your answers:

a) angle  $OCA$

b) angle  $DAB$

[1]

## Solutions for the assessment Circle Theorems (advanced) - reasons required

1) a) angle  $BAC = 48^\circ$

b) angle  $ADC = 48^\circ$

Reason: Angle in a semicircle + angle between tangent and radius + angle sum of triangle

2) angle  $BDC = 52^\circ$

Reason: Angle in a semicircle + angle sum of triangle + angles in same segment

3) a) angle  $x = 78^\circ$

b) angle  $y = 141^\circ$

Reason: Angle at centre and circumference + cyclic quadrilateral

4) angle  $BAE = 75^\circ$

Reason: Angle at centre and circumference + angle between tangent and radius

*or* angles on a straight line + isosceles triangle + angle sum of triangle + angle between tangent and radius

5) angle  $OAB = 26^\circ$

Reason: Angle between tangent and radius + isosceles triangle + angle sum of triangle

6) a) angle  $ACD = 85^\circ$

b) angle  $AED = 95^\circ$

Reason: Angles in the same segment + cyclic quadrilateral

7) angle  $DBC = 56^\circ$

Reason: Angles in the same segment + cyclic quadrilateral

8) a) angle  $OCA = 65^\circ$

b) angle  $DAB = 65^\circ$

Reason: Alternate Segment Theorem + angle between tangent and radius + isosceles triangle

*or* angle between tangent and radius + isosceles triangle + angle in a semicircle