Unit 8: Circle Geometry
Name: $\qquad$
8.3 Properties of Angles in a Circle - Worksheet

1. Point $O$ is the centre of each circle.

Determine the values of $x^{\circ}$ and $y^{\circ}$.
Justify your solutions.
a)


$$
x^{0}=2(65)=130^{\circ}
$$

b)

$x^{\circ}=90^{\circ}$

$$
=180-130
$$

$$
=50^{\circ}
$$

3. Use the properties of inscribed and central angles to explain why all angles inscribed in a semicircle are right angles.
c)


$$
\angle A C B=180-125=55^{\circ}
$$

$$
x^{\circ}=2\left(55^{\circ}\right)=110^{\circ}
$$

$$
\triangle A O B \text { is is oc. }
$$

$$
\begin{aligned}
& 180-110=70^{\circ} \\
& y 0=70: 2=35^{\circ}
\end{aligned}
$$

All the inscribed angles are $90^{\circ}$ since the central
angle is a straight line ( $180^{\circ}$ )
and all inscribed angles are half the central angle.
4. A student looked at the diagram below and concluded that $x^{\circ}=y^{\circ}$.

The student justified that conclusion by saying that both angles are subtended by arc AB.
What is the student's error?
What are the values of $x^{\circ}$ and $y^{\circ}$ ?


$$
\begin{aligned}
& x^{0}=\frac{1}{2}\left(170^{\circ}\right)=85^{\circ} \\
& y^{0}=\frac{1}{2}\left(190^{\circ}\right)=95^{\circ}
\end{aligned}
$$

$$
360.170^{\circ}=190^{\circ}
$$

The student never realized at angle $x^{0}$ is subtended by the minor arc $A B$ and $y^{0}$ is subtended by the major arc $A B$.
5. Point O is the centre of the circle; DB is a diameter.

Determine the values of $w^{\circ}, x^{\circ}, y^{\circ}$, and $z^{\circ}$.
Justify your solutions.


$$
\begin{aligned}
& y^{\circ}=90-60=30^{\circ} \\
& z^{\nu}=30^{\circ} \\
& \omega^{\circ}=30^{\circ} \\
& \angle A O B=180-(30+30) \\
& =180-60 \\
& \\
& =120^{\circ} \\
& x^{\circ}=180-120^{\circ}=60^{\circ}
\end{aligned}
$$

