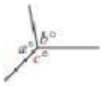
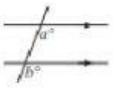
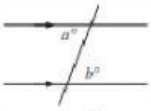
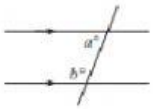
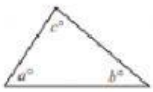
ANGLE PROPERTIES

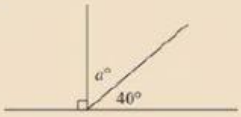
Title	Property	Figure
Angles centred at a point	The sum of the sizes of the angles at a point is 360°.	 $a+b+c=360$
Adjacent angles on a straight line	The sum of the sizes of the angles on a line is 180°. The angles are supplementary.	 $a+b=180$
Adjacent angles in a right angle	The sum of the sizes of the angles in a right angle is 90°. The angles are complementary.	 $a+b=90$
Vertically opposite angles	Vertically opposite angles are equal in size.	 $a=b$
Corresponding angles	When two *parallel* lines are cut by a third line, then angles in corresponding positions are equal in size.	 $a=b$
Alternate angles	When two *parallel* lines are cut by a third line, then angles in alternate positions are equal in size.	 $a=b$

Title	Property	Figure
Co-interior angles (also called allied angles)	When two *parallel* lines are cut by a third line, then co-interior angles are supplementary.	 $a+b=180$
Angles of a triangle	The sum of the interior angles of a triangle is 180°.	 $a+b+c=180$
Exterior angle of a triangle	The size of the exterior angle of a triangle is equal to the sum of the interior opposite angles.	 $c=a+b$
Angles of a quadrilateral	The sum of the interior angles of a quadrilateral is 360°.	 $a+b+c+d=360$

Example

Find, giving brief reasons, the value of the unknown in:

a



b

a $90 + a + 40 = 180$ {angles on a line}

$\therefore \quad a + 130 = 180$

$\therefore \quad a = 50$

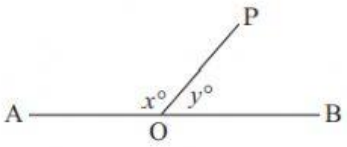
b $2x - 100 = x$ {equal corresponding angles}

$\therefore \quad 2x - 100 - x = x - x$ {subtracting x from both sides}

$\therefore \quad x - 100 = 0$ {simplifying}

$\therefore \quad x = 100$

1 Use the figure illustrated to answer the following questions:
AB is a fixed line and OP can rotate about O between OA and OB.



a If $x = 136$, find y.

b If $y = 58$, find x.

c What is x if y is 39?

d If x is 0, what is y?

e If $x = 81$, find y.

f If $x = y$, what is the value of each?

a.

b.

c.

d.

e.

f.