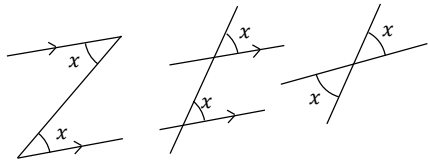


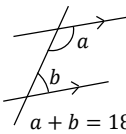
Prerequisites: Angles in a triangle sum to 180° , angles on a straight line sum to 180° , isosceles triangles.



Alternate ("Z") angles are equal.

Corresponding ("F") angles are equal.

Vertically opposite ("X") angles are equal.

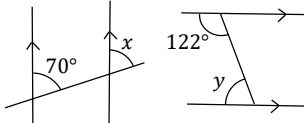


Co-interior/allied ("C") angles add to 180° .

$a + b = 180^\circ$

'Vertically' here means 'opposite with respect to a vertex'.

Worked Example 1: Determine x and y .



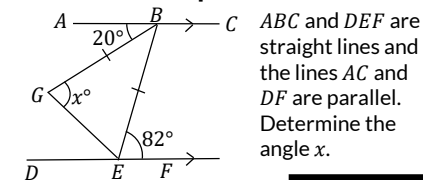
$x = 70^\circ$

Co-interior angles add to 180° .

$y = 180^\circ - 122^\circ = 58^\circ$

Corresponding angles are equal. Notice that the angle is in the same orientation but just shifts across.

Worked Example 2:



ABC and DEF are straight lines and the lines AC and DF are parallel. Determine the angle x .

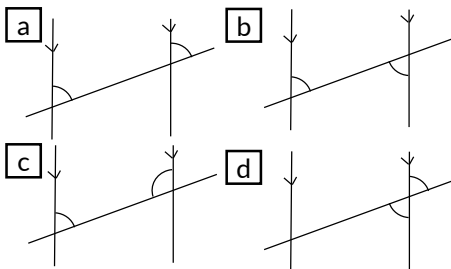
Alternate angles are equal. Notice that $ABEF$ forms a 'Z' shape.

$\angle ABE = 82^\circ$
 $\angle GBE = 82^\circ - 20^\circ = 62^\circ$
 $x = \frac{180 - 62}{2} = 59^\circ$

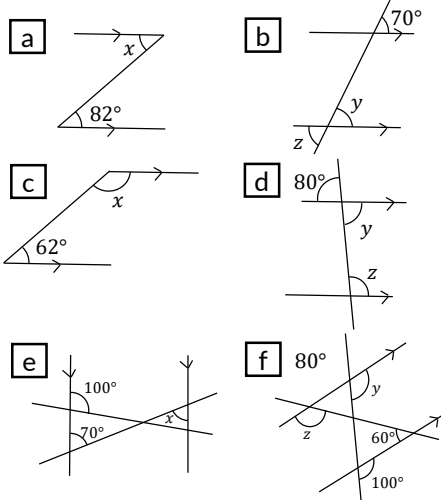
Triangle BGE is isosceles.

Core Questions

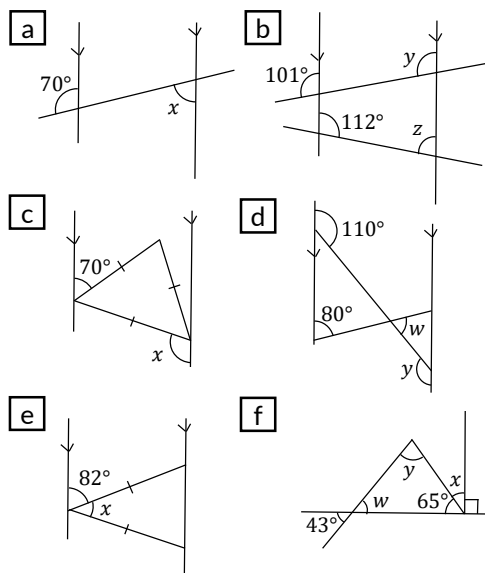
1 Identify whether each pair of angles are alternate, corresponding, co-interior or vertically opposite.



2 Determine the value of the variable(s) in each diagram.

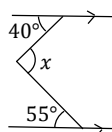


3 Determine the value of the variable(s) in each diagram.

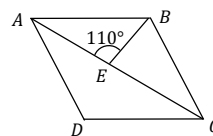


Problem Solving

4 Determine the value of x .



5 $ABCD$ is a rhombus and $BC = EC$. Determine $\angle ABE$.



Solutions:
 1(a) Corresponding (b) Alternate (c) Co-interior (d) Opposite
 2(a) 82° (b) $y = 70^\circ, z = 70^\circ$ (c) 118° (d) $y = 80^\circ, z = 100^\circ$
 (e) $x = 70^\circ$ (f) $y = 80^\circ, z = 120^\circ$
 3(a) 110° (b) $y = 101^\circ, z = 68^\circ$ (c) $y = 110^\circ, w = 30^\circ$
 (e) 16° (f) $x = 25^\circ, y = 72^\circ, w = 43^\circ$
 4. $x = 95^\circ$ 5. $\angle ABE = 30^\circ$