Learning outcomes

At the end of this chapter, Learners will:

- Identify related angles
- Find angles associated with straight lines
- Find angles of elevation and depression
- Solve problems related to real life

CONCISE INFORMATION

Related angles

(a) Complementary angles

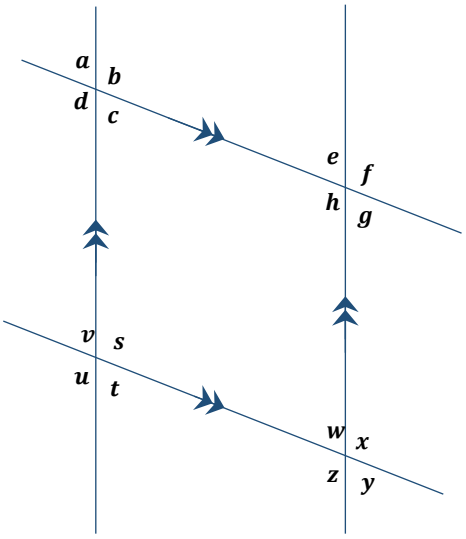
Two angles are complementary if they add up to 90^o. Angles P and Q are complementary if $P + Q = 90^o$.

(b) Supplementary angles

Two angles are supplementary if they add up to 180^o. Angles P and Q are supplementary if $P + Q = 180^o$.

Angles associated with straight lines

Properties of parallel lines or angles associated with parallel lines are very useful in finding bearings



(a) Corresponding angles are equal.
e.g. $\measuredangle a = \measuredangle e$, $\measuredangle b = \measuredangle f$, $\measuredangle u = \measuredangle z$, $\measuredangle v = \measuredangle w$ *e.t.c*

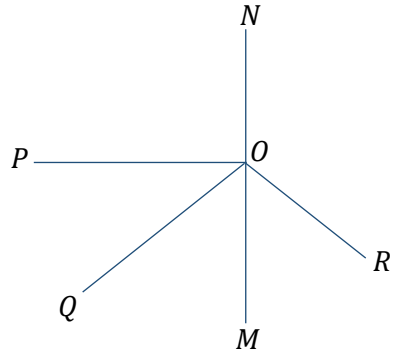
(b) Alternate angles are equal.
e.g. $\measuredangle b = \measuredangle h$, $\measuredangle d = \measuredangle s$, $\measuredangle s = \measuredangle z$, $\measuredangle g = \measuredangle w$ *e.t.c*

(c) Allied angles are supplementary (*add up to* 180^0)
e.g. $\measuredangle c + \measuredangle s = \mathbf{180^o}$, $\measuredangle h + \measuredangle w = \mathbf{180^o}$, $\measuredangle g + \measuredangle x = \mathbf{180^o}$, $\measuredangle d + \measuredangle v = \mathbf{180^o}$

(d) Vertically opposite angles are equal
e.g. $\measuredangle a = \measuredangle c$, $\measuredangle b = \measuredangle d$, $\measuredangle e = \measuredangle g$, $\measuredangle h = \measuredangle f$, $\measuredangle v = \measuredangle t$ *e.t.c*

Angles at a point

All the angles around a given point add up to 360^o.

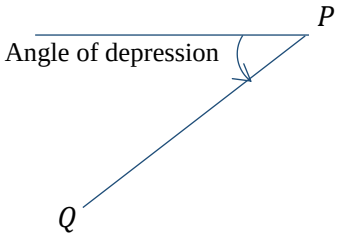


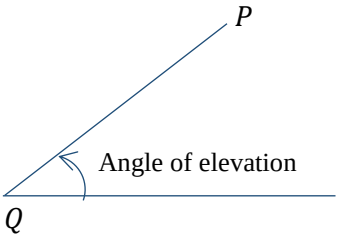
Note that:

$\angle NOR + \angle ROM + \angle MOQ + \angle QOP + \angle PON = 360^o$

Angles of elevation and depression

The angle of depression is the angle subtended from the horizontal of the eye sight downwards. And the angle of elevation is the angle subtended from the horizontal of the eye sight upwards.

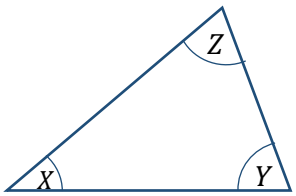




Note: *Calculations of angle of depression and elevation are based on allied angles*

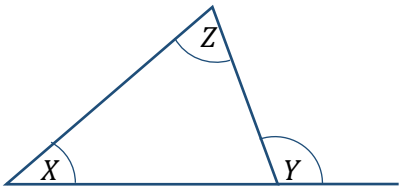
Angle properties of a triangle

(a) Interior angles of a triangle



The three interior angles of a triangle add up to 180^o. In the diagram,
$\angle X + \angle Y + \angle Z = 180^o$

(b) Exterior angles of a triangle



The exterior angle of a triangle is equal to the sum of two opposite angles. In the diagram,
$\angle X + \angle Z = +\angle Y$