MATHEMATICS

SOLUTION

1(a) Let the other side of first triangle be s

$90^0 + x + s = 180^0$ (sum of angles in a triangle)

$x = s$ (base of isosceles triangle)

$90^0 + x + x = 180^0$

$90^0 + 2x = 180^0$

$2x = 180^0 - 90^0$

$2x = 90^0$ (Divide both sides by 2)

$x = 45^0$

$x + 90^0 = y$ (sum of two adjacent interior angles)

$45^0 + 90^0 = y$

$135^0 = y$

Therefore, $y = 135^0$

Let the other unknown side in second triangle be m

$m + 37^0 + z = 180^0$

$m = 45^0$ (vertically opposite angles are equal)

$45^0 + 37^0 + z = 180^0$ (sum of angles in a triangle)

$82^0 + z = 180^0$

$z = 180^0 - 82^0$

$z = 98^0$

(b) $x + 35^0 + 2x + 97^0 = 360^0$ (sum of angles in a quadrilateral)

$x + 2x + 35^0 + 97^0 = 360^0$

$3x + 132^0 = 360^0$

$3x = 360^0 - 132^0$

$3x = 228^0$ (Divide both sides by 3)

$x = 76^0$

$x + y = 180^0$ (sum of angles on a straight line)

$76^0 + y = 180^0$

$y = 180^0 - 76^0$

$y = 104^0$

(c) $n = 108^0$ (congruent angles)

$m + 108^0 + 108^0 + 31^0 = 360^0$ (sum of angles in a quadrilateral)

$m + 247^0 = 360^0$

$m = 360^0 - 247^0$

$m = 113^0$

(d) Let the other angle be z

$132^0 + z = 180^0$ (sum of angles on a straight line)

$z = 180^0 - 132^0$

$z = 48^0$

Also, let the unknown angle be P

$38^0 + 48^0 + P = 180^0$ (angles in a triangle)

$86^0 + P = 180^0$

$P = 180^0 - 86^0$

$P = 94^0$

In the quadrilateral,

$y = 94^0$ (vertically opposite angles)

$w + 129^0 = 180^0$ (angles on a straight line)

$w = 180^0 - 129^0$

$w = 51^0$

Therefore,

$94^0 + 51^0 + 90^0 + x = 360^0$ (sum of angles in a quadrilateral)

$235^0 + x = 360^0$

$x = 360^0 - 235^0$

$x = 125^0$

(2) Sum of the interior angles of a polygon is 180^0. Find the number of sides of the polygon.

SOLUTION

$(n - 2)\ 180^0 = 180^0$

Divide both sides by 180^0

$n - 2 = 1$

$n = 1 + 2$

$n = 3$

Therefore, the polygon has 3 sides.

(3) The interior angles of a pentagon are: $(y + 13)^0$, $(y + 15)^0$, $(y + 23)^0$, $(y + 29)^0$ and $(y + 40)^0$.

Find (a) the value of y.

(b) the value of each interior angle.

SOLUTION

(a) There are 5 interior angles in a Pentagon, therefore n = 5.

$(n - 2)\ 180^0$ (interior angles)

$(5 - 2)\ 180^0$

$= 3 \text{ X } 180^0$

$= 540^0$

$y + 13^0 + y + 15^0 + y + 23^0 + y + 29^0 + y + 40^0 = 540^0$ (sum of angles in a pentagon)

Collect like terms

$y + y + y + y + y + 13^0 + 15^0 + 23^0 + 29^0 + 40^0 = 540^0$

$5y + 120^0 = 540^0$

$5y = 540^0 - 120^0$

$5y = 420^0$

Divide both sides 5

$y = 84^0$

(b) Angle 1 : $y + 13^0$

$84^0 + 13^0$

$= 97^0$

Angle 2: $y + 15^0$

$84^0 + 15^0$

$= 99^0$

Angle 3: $y + 29^0$

$84^0 + 23^0$

$= 107^0$

Angle 4: $y + 29^0$

$84^0 + 29^0$

$=113^0$

Angle 5: $y + 40^0$

$84^0 + 40^0$

$= 124^0$