2) In the fig, lines PQ, MN and RS are intersecting eachother at O

$x : y = 1 : 2$, $z = 90^\circ$

$\angle MOQ = \angle PQN = z$

Now RS is a straight line

$\therefore x + z + y = 180^\circ$

$\Rightarrow x + y + 90^\circ = 180^\circ$

$\Rightarrow x + y = 180^\circ - 90^\circ = 90^\circ$

But $x : y = 1 : 2$

Let $x = a$ then $y = 2a$

$\therefore a : 2a = 90^\circ$

$\Rightarrow 3a = 90^\circ$

$\Rightarrow a = \frac{90^\circ}{3} = 30^\circ$

$\therefore x = 30^\circ$ and $y = 2a = 2 \times 30^\circ = 60^\circ$

Now, $\angle ROM = y = 60^\circ$

and $\angle PQR = \angle SOQ$

$= x = 30^\circ$

23) In the figure,

$5x + x + 80^\circ + 123^\circ + 85^\circ = 360^\circ$

$\Rightarrow 6x + 80^\circ + 123^\circ + 85^\circ = 360^\circ$

$\Rightarrow 6x + 288^\circ = 360^\circ$

$\Rightarrow 6x = 360^\circ - 288^\circ = 72^\circ$

$\Rightarrow x = \frac{72^\circ}{6} = 12^\circ$

Now, $\angle AOB = 5x = 5 \times 12^\circ = 60^\circ$

and $\angle BOC = x = 12^\circ$

24) In the fig,

$3\frac{1}{2}y^\circ + 2y^\circ + 2y^\circ + 2\frac{1}{2}y^\circ = 360^\circ$

$\Rightarrow \frac{7}{2}y^\circ + 2y^\circ + 2y^\circ + \frac{5}{2}y^\circ = 360^\circ$

$\Rightarrow \frac{7}{2}y^\circ + \frac{5}{2}y^\circ + 4y^\circ = 360^\circ$

$\Rightarrow \frac{12}{2}y^\circ + 4y^\circ = 360^\circ$

$\Rightarrow 6y^\circ + 4y^\circ = 360^\circ$

$\Rightarrow 10y^\circ = 360^\circ$

$\Rightarrow y = \frac{360^\circ}{10} = 36^\circ$

$\therefore \angle AOB = 3\frac{1}{2}y^\circ = \frac{7}{2}y^\circ = \frac{7}{2} \times 36^\circ$

$= 126^\circ$

$\angle BOC = 2y^\circ = 2 \times 36 = 72^\circ$

$\angle COD = 2y^\circ = 72^\circ$

$\angle DOA = 2\frac{1}{2}y^\circ = \frac{5}{2}y^\circ$

$= \frac{5}{2} \times 36^\circ = 90^\circ$

25) AB, CD and EF are intersecting each other at O and $\angle DOF = x^0$, $\angle AOC = y^0$

and $\angle BOE = x^0$

But $\angle DOB = \angle AOC = y^0$

Similarly, $\angle COE = \angle DOF = x^0$

and $\angle AOF = \angle BOE = x^0$

$\because$ CD is a straight line

$\therefore \angle COE + \angle BOE + \angle DOB = 180^0$

$\Rightarrow x^0 + x^0 + y^0 = 180^0$

$\Rightarrow x^0 + y^0 + x^0 = 180^0$

i) If $y = 45^0$ and $x = 90^0$, then

$\Rightarrow x^0 + 45^0 + 90^0 = 180^0$

$\Rightarrow x^0 + 135^0 = 180^0$

$\therefore x^0 = 180^0 - 135^0 = 45^0$

ii) If $x = 3a$, $y = 5x$, $z = 6x$,

then $x + y + z = 180^0$

$\Rightarrow x + 5x + 6x = 180^0 \Rightarrow 12x = 180^0$

$\Rightarrow x = \frac{180^0}{12} = 15^0$

But $x = 3a$

$\therefore 3a = 15^0$

$\Rightarrow a = \frac{15^0}{3} = 5^0$

Hence $a = 5^0$