Exercise 3E

Question 47:
$\angle A + \angle B + \angle C = 180°$
$x + 3x + y = 180$
$4x + y = 180$ ---(1)
Also,
$3y - 5x = 30$
$-5x + 3y = 30$ ---(2)
Multiplying (1) by 3 and (2) by 1, we get
$12x + 3y = 540$ ---(3)
$-5x + 3y = 30$ ---(4)
Subtracting (4) from (3), we get
$17x = 510$
$x = 30$
Putting $x = 30$ in (1), we get
$4 \times 30 + y = 180$
$y = 60$
Hence $\angle A = 30°$, $\angle B = 3 \times 30° = 90°$, $\angle C = 60°$
Therefore, the triangle is right angled.

Question 48:
In a cyclic quadrilateral ABCD:
$\angle A = (x + y + 10)°$,
$\angle B = (y + 20)°$,
$\angle C = (x + y - 30)°$,
$\angle D = (x + y)°$
We have, $\angle A + \angle C = 180°$ and $\angle B + \angle D = 180°$
[since ABCD is a Quadrilateral]
Now,
$\angle A + \angle C = (x + y + 10)° + (x + y - 30)° = 180°$
$2x + 2y - 20° = 180°$
$x + y - 10° = 90°$
$x + y = 100$ ---(1)
Also,
$\angle B + \angle D = (y + 20)° + (x + y)° = 180°$
$x + 2y + 20° = 180°$
$x + 2y = 160°$ ---(2)
Subtracting (1) from (2), we get
$y = 160 - 100 = 60$
Putting $y = 60$ in (1), we get
$x = 100 - y$
$x = 100 - 60$
$x = 40$
Therefore,

$$\angle A = (x + y + 10)° = (60 + 40 + 10)° = (100 + 10)° = 110°$$

$$\angle B = (y + 20)° = (60 + 20)° = 80°$$

$$\angle C = (x + y - 30)° = (60 + 40 - 30)° = (100 - 30)° = 70°$$

$$\angle D = (x + y)° = (60 + 40)° = 100°$$

********** END **********