**1.Ajay and Vijay have some marbles with them. Ajay told Vijay “if you give me ‘x’ marbles, both of us will have equal number of marbles”. Vijay then told Ajay “if you give me twice as many marbles, I will have 30 more marbles than you would”. Find ‘x’?**

If Vijay gives 'x' marbles to Ajay then Vijay and Ajay would have V - x and A + x marbles.

V - x = A + x --- (1)

If Ajay gives 2x marbles to Vijay then Ajay and Vijay would have A - 2x and V + 2x marbles.

V + 2x - (A - 2x) = 30 => V - A + 4x = 30 --- (2)

From (1) we have V - A = 2x

Substituting V - A = 2x in (2)

6x = 30 => x = 5.

**2.A box contains 2 white shirts, 3 black shirts, and 4 red shirts. In how many ways can 3 shirts be drawn from the box, if at least one black shirt is to be included in the draw?**

If balls of same colour are identical

3 Balls

1 Black → (3 possibilities RRWW​RW )

2 Black → (2 possibilities W (or) R)

3 Black → only 1

So Total 6

If balls of same color are different

then

1 Black (2 white) →3C1​×2C2​

1 Black (2 red) →3C1​×4C2​

1 Black (1 Red  1 white) →3C1​×4C1​×2C1​

2 Black (Red white) →3C2​×4C1​

→3C2​×2C1​

3 Black →3C3​

Total =3+18+24+12+6+1

=64