Week 8 – Long Answer Question

Question 1: Finding 'x'

Let:

- Ajay has AA marbles.
- Vijay has VV marbles.

From the problem statements, we can set up the following equations:

1. Ajay's Statement:

- If Vijay gives xx marbles to Ajay:

A+x=V−xA+x=V−x

Rearranging gives:

A+2x=V Equation 1 A+2x=V Equation 1

2. Vijay's Statement:

- If Ajay gives 2x2x marbles to Vijay:

V+2x=A−2x+30V+2x=A−2x+30

Rearranging gives:

V+4x=A+30 Equation 2 V+4x=A+30 Equation 2

Now, substitute Equation 1 into Equation 2:From Equation 1, we know A=V−2xA=V−2x. Substitute this into Equation 2:

V+4x=(V−2x)+30V+4x=(V−2x)+30

Simplifying:

V+4x=V−2x+30V+4x=V−2x+30

6x=306x=30

x=5x=5

Final Answer for Question 1:

x=5x=5

Question 2: Drawing Shirts with At Least One Black Shirt

Total shirts in the box:

- White: 2
- Black: 3
- Red: 4

Total shirts = 2+3+4=92+3+4=9.Total ways to choose any 3 shirts from 9 shirts:

Total ways=(93)=9!3!(9−3)!=9×8×73×2×1=84.Total ways=(39)=3!(9−3)!9!=3×2×19×8×7=84.

Ways to choose shirts without any black shirts:

- Only white and red shirts available (2 white + 4 red = 6 shirts).

Ways without black=(63)=6!3!(6−3)!=6×5×43×2×1=20.Ways without black=(36)=3!(6−3)!6!=3×2×16×5×4=20.

Ways to choose at least one black shirt:

At least one black=Total ways−Ways without blackAt least one black=Total ways−Ways without black

=84−20=64.=84−20=64.

Final Answer for Question 2:

64 ways to draw shirts with at least one black shirt.

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