

# P12 - 2.5 - Odds Marbles Probability Notes

You have 3 blue marbles and 2 red marbles in a bucket, a total of 5 marbles. let  $b = \text{Blue}$   
let  $r = \text{Red}$



**Odds**  
Favourable Outcomes : Unfavourable Outcomes

part : part

**Choose a Marble. What are the odds?**

Odds in favour of Blue :  
3Blue: 2Red  
 $3:2 \leftarrow 5 - 3 = 2$

Odds in favour of Red :  
3Red: 2Blue  
 $2:3 \leftarrow 5 - 2 = 3$

$p(b) = \frac{3}{5}$  Probability =  $\frac{\text{Part}}{\text{Total}}$   
 $p(r) = 1 - \frac{3}{5} = \frac{2}{5}$

Unfavourable Outcomes = Total Outcomes - Favourable Outcomes

Blue to total? Red to total?  
3 Blue : 5 Total 2 Red : 5 Total  
 $3:5$  Part to Total  $2:5$

Red to Blue to total?  
 $r : b : T$   
 $2 : 3 : 5$

A box has 9 Blue marbles in the same ratio as above. How many Red marbles and Total marbles are in the box?

$\times 3 \left\{ \begin{array}{l} 3 \text{ Blue} : 2 \text{ Red} \\ 9 \text{ Blue} : ? \text{ Red} \end{array} \right. \times 3$   $9 \div 3 = 3$  Bigger divided by smaller  
 $2 \times 3 = 6$   $9 \text{ Blue} + 6 \text{ Red} = 15 \text{ Marbles}$   
6 Red Marbles There are 15 marbles in the larger box.

A box has 25 marbles in the same ratio as above. How many Red marbles are in the box?

$\times 5 \left\{ \begin{array}{l} 2 \text{ Red} : 5 \text{ Total} \\ ? \text{ Red} : 25 \text{ Total} \end{array} \right. \times 5$   
 $2 \times 5 = 10$   $25 - 10 = 15$   
10 Red Marbles 15 Blue Marbles

**Pick a Card.**

**What are the odds of choosing an Ace?**

4 Aces : 48 Other Cards  
 $4:48$   $52 - 4 = 48$   
 $1:12$   
let  $a = \text{ace}$   $p(a) = \frac{4}{52} = \frac{1}{13}$

**What are the odds of choosing a Heart?**

13 Hearts : 39 Other Cards  
 $13:39$   $52 - 13 = 39$   
 $1:13$   
let  $h = \text{heart}$   $p(h) = \frac{13}{52} = \frac{1}{13}$

Roll a Dice

**What are the odds of rolling a 6?**

$1:5$   $p(6) = \frac{1}{6}$

**What are the odds of Not rolling a 6?**

$5:1$   $p(1-5) = 1 - \frac{1}{6} = \frac{5}{6}$