12-3 Probability

std. 19.0

What is probability?

$$= \frac{\#\text{ of favorable outcomes}}{\text{total \# of outcomes}}$$

1. Roll 1 die. What is the probability that you roll a number that is less than or equal to 4?

$$\frac{4}{6} = \frac{2}{3}$$

2. Roll 2 dice. What is the probability that the sum is 6 or 7?

1,5 4,2 (6)
5,1 3,3
2,4

+ (7)
1,6 2,5 3,4
6,1 5,2 4,3

$$\frac{5+6}{\underset{\text{1st}}{6} \times \underset{\text{2nd}}{6}} = \frac{11}{36}$$

3 Flip 3 coins. What is the probability that 2 heads and 1 tail will be face up?

total outcomes = 8

H or T H or T H or T

2 × 2 × 2

HHT

HTH

THH

$\frac{3}{8}$

4 Five boys and 3 girls are applying for a summer job. Three applicants will be selected.

Find the probability that:

a) all 3 are boys

b) 2 are girls and 1 is a boy

$\frac{15}{56}$

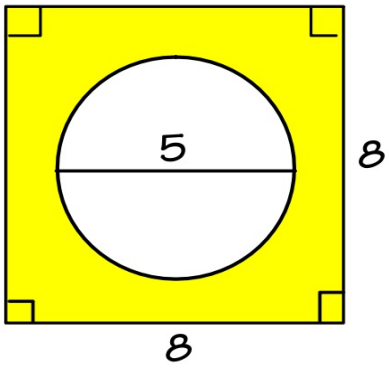
$3B \rightarrow {}_5C_3 = \frac{5!}{2!3!} = \frac{5 \cdot 4}{2}$

any 3 $\rightarrow {}_8C_3 = \frac{8!}{3!5!} = \frac{8 \cdot 7 \cdot 6}{6} = \frac{10}{56} = \frac{5}{28}$

$\frac{{}_3C_2 \times {}_5C_1}{{}_8C_3}$ ← any 3 $= \frac{3 \times 5}{56}$

(G: ${}_3C_2$, B: ${}_5C_1$)

5 Find the probability that a dart thrown at the target shown hits in the yellow area.



$$\frac{\square - \bigcirc}{\square} = \frac{64 - (2.5^2)\pi}{64}$$

$$\approx .693$$