

# Probability

Probability is the likelihood of something happening.

The probability of event  $A$  is  $P(A)$ .

Probability can be written as a fraction, decimal, or percent and it is always between 0 and 1.

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$P = 0$

Not going  
to happen

$P = 0.5$

Equally likely  
to happen or  
not happen

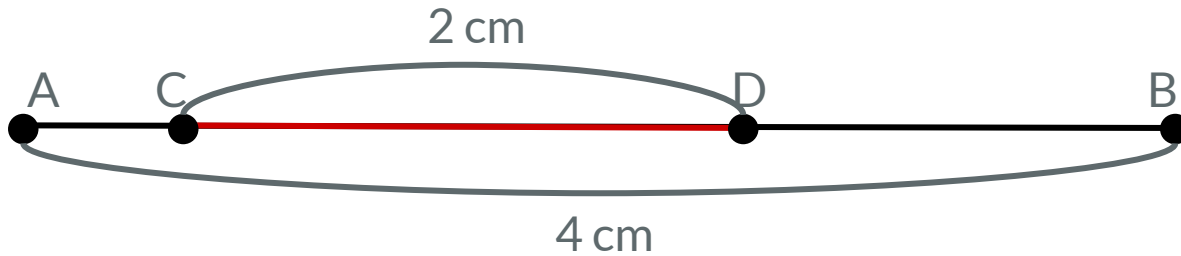
$P = 1$

Definitely going  
to happen

# Probability and Length

If I have line AB, that is 4 cm long, and line CD on AB that is 2 cm long. What's the likelihood of point  $K$  landing on line CD?

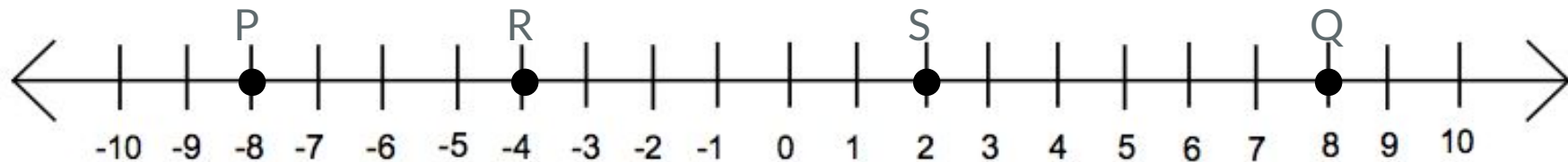
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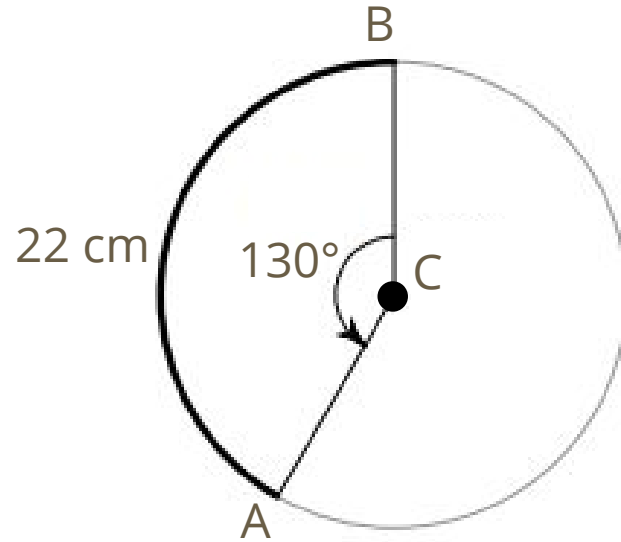
The likelihood of a point  $K$  landing on line CD is the ratio of the length of CD to the length of AB.

$$P(k \text{ landing on } CD) = \frac{\text{Length of } CD}{\text{Length of } AB}$$

Find the probability that a point chosen at random on PQ is on RS.



If point  $K$  is on circle  $C$ . What is the likelihood of it being on arc  $AB$ ?





# Probability and Area

The likelihood that a point  $K$  randomly chosen from the region  $J$  also lies in region  $M$  is equal to the ratio of the areas.



$$P(K \text{ in Region } M) = \frac{\text{Area of } M}{\text{Area of } J}$$



The diameter of the target shown is 80 cm. The diameter of the yellow center circle is 16 cm. An arrow is shot and hits the target. If the arrow is equally likely to land on any point on the target, what is the probability that it lands in the yellow circle?



A dart game uses a target with concentric circles with radii 5, 8, and 12 inches. A dart is thrown and hits the target. If the dart is equally likely to hit any point on the target, what is the probability of earning 20 points?

