

Geometric Probability and Conditional Probability: math test, Grade 10 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Counting

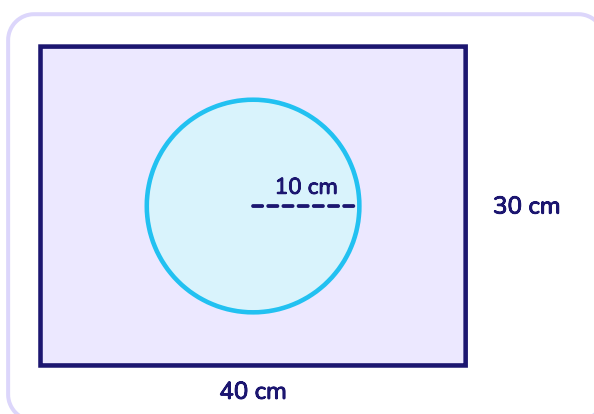
/ 3 pts

A coach has 9 players. (a) In how many ways can a captain and then a vice captain be chosen? (b) In how many ways can 3 players be chosen for a relay team? (c) Explain why the two answers differ.

2 Geometric probability

/ 4 pts

A rectangular board is 40 cm by 30 cm and has a circle of radius 10 cm drawn entirely inside it. A dart lands at a random point of the board. (a) Find the probability that it lands in the circle (exact value, then a decimal rounded to three places). (b) Find the probability that it does not. (c) A traffic light is green for 40 s, yellow for 5 s and red for 35 s in each cycle. At a random moment, what is the probability that the light is red?



3 Walking or riding

/ 4 pts

A survey of 120 students gave this table.

	Grade 9	Grade 10
Walks	18	30
Rides	42	30

(a) Find the row and column totals. (b) Find $P(\text{walks})$ and $P(\text{walks} \mid \text{Grade 10})$. (c) Are “walks” and “Grade 10” independent? Justify.

4 Union and complement

/ 3 pts

For events A and B : $P(A) = 0.55$, $P(B) = 0.4$, $P(A \cap B) = 0.25$. Find (a) $P(A \cup B)$, (b) the probability that neither occurs, (c) $P(A \mid B)$.

5

Spinner and die

/ 3 pts

A spinner lands on red with probability 0.3. It is spun once and a fair die is rolled once, independently. Find (a) $P(\text{red and even})$, (b) $P(\text{red or even})$, (c) the probability that two spins give at least one red.

6

Draws without replacement

/ 3 pts

A bag has 4 green and 6 yellow balls. Two are drawn without replacement. Find (a) $P(\text{both green})$, (b) $P(\text{second green} \mid \text{first yellow})$, (c) $P(\text{one of each color})$.

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