

Mockbank

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Introduction to Statistics

Midterm Mock 1 — Preview

Exam-style practice with detailed grading schemes.

Available on mockbank.net

- 3 complete mock midterms
- Full worked solutions and grading schemes
- Exam layout with answer boxes, 20 points per mock
- English and Dutch versions

In this preview

- Page 2 — a complete sample question from Mock 1
- Pages 3–4 — the complete grading scheme for that question
- Page 5 — what the rest of the mock contains

Pricing

1 mock + grading scheme €5

All 3 mocks + grading schemes €12.50

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Question 1 · BMT · 5 points

a. [2 points]

Compute:

$$\sum_{k=1}^6 (3k - 2), \quad \prod_{k=1}^5 \frac{k}{k+2}.$$

Show how you work out the notation.

Answer 1a**b. [2 points]**Use the binomial formula to determine the coefficient of x^5 in

$$(1 - 2x)^7.$$

Answer 1b**Presentation: 1 point.**

Maximum 20 points (5 + 10 + 5). Tick the criteria that apply to each part. An answer that reaches the same result by another valid route earns full marks; see “Also accepted” under each part. The criteria are meant to be route-neutral: judge whether the step was taken, not whether it was written exactly as in the model answer.

Question 1 · BMT · 5 points

Question 1a [2 points]

Compute $\sum_{k=1}^6 (3k - 2)$ and $\prod_{k=1}^5 \frac{k}{k+2}$. Show how you work out the notation.

Model answer

$$\sum_{k=1}^6 (3k - 2) = 1 + 4 + 7 + 10 + 13 + 16 = 51.$$

$$\prod_{k=1}^5 \frac{k}{k+2} = \frac{1}{3} \cdot \frac{2}{4} \cdot \frac{3}{5} \cdot \frac{4}{6} \cdot \frac{5}{7} = \frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5}{3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} = \frac{1 \cdot 2}{6 \cdot 7} = \frac{1}{21}.$$

Also accepted (full marks):

- Sum split up: $3 \sum_{k=1}^6 k - \sum_{k=1}^6 2 = 3 \cdot 21 - 12 = 51$.
- Product written as $\frac{5! \cdot 2!}{7!} = \frac{240}{5040} = \frac{1}{21}$, provided it is simplified.
- Numerator and denominator evaluated rather than cancelled (120/2520), provided the result is simplified to 1/21.

Grading scheme

1 / 2 pts

☒ **Correct answer** 2 pts
 $\sum = 51$ and $\prod = \frac{1}{21}$, both with the notation worked out.

☐ **Sum only** 1 pt
 51 with visible intermediate steps.

☐ **Product only** 1 pt
 $\frac{1}{21}$ with visible intermediate steps.

☐ **– notation not worked out** –1 pt
 Only the final numbers, while the question asks for the working.

☐ **– product not simplified** –0.5 pts
 For example 120/2520 given as the final answer.

☐ **– minor arithmetic slip** –0.5 pts
 Method and notation correct.

Question 1b [2 points]

Use the binomial formula to determine the coefficient of x^5 in $(1 - 2x)^7$.

Model answer

$$(1 - 2x)^7 = \sum_{k=0}^7 \binom{7}{k} 1^{7-k} (-2x)^k, \quad k = 5: \quad \binom{7}{5} (-2)^5 x^5 = 21 \cdot (-32) x^5 = -672 x^5.$$

The coefficient is -672 .

Also accepted (full marks):

- Roles of a and b swapped: $(-2x + 1)^7$ with the term $\binom{7}{5}(-2x)^5 1^2$.
- $\binom{7}{5} = 21$ read off Pascal's triangle rather than computed from factorials.
- $\binom{7}{5}$ replaced by $\binom{7}{2}$ with a reference to symmetry.

Grading scheme

1 / 2 pts

☒ **Correct answer** 2 pts
 -672 , obtained from the term at $k = 5$.

☐ **Right term identified** 1 pt
 $\binom{7}{5}(-2)^5$ recognised, arithmetic slip in the value.

☐ **Formula right, wrong k** 1 pt
 Binomial formula set up correctly but the wrong power selected.

☐ **– sign dropped** –1 pt
 Answer $+672$.

☐ **– factor not raised** –1 pt
 Only x raised to the power, $(-2)^5$ omitted.

Question 1: presentation [1 point]**Grading scheme**

1 / 1 pt

☒ **Presentation in order** 1 pt
 Complete sentences, all symbols defined, every step explained, legible structure.

☐ **– symbols not defined** –0.5 pts
 Notation used without saying what it stands for.

☐ **– bare formulas, no text** –0.5 pts
 No connected argument, no punctuation.

This is the complete grading scheme for Question 1 as it appears in the full pack. Every question in every mock is graded to this level of detail.

Full Mock 1 · What the rest contains · 20 points in total

The full mock has three questions worth $5 + 10 + 5 = 20$ points. Question 1 is shown in full on page 2; the other two are summarised below without revealing the questions themselves.

Question 1 · BMT**5 points**

Working out sum and product notation, and using the binomial formula to pick out one coefficient. *Shown in full on page 2.*

Question 2 · Counting problem**10 points**

Three parts: describing a sample space for independent choices and counting it, counting the outcomes of a constrained event while justifying that nothing is double counted, and computing a conditional probability given that event.

Question 3 · Proof or counterexample**5 points**

Deciding whether a stated probability inequality holds for all events, and then either proving it strictly from the listed axioms and rules with a justification at every step, or refuting it with a concrete counterexample.

Each question carries a separate presentation point, graded on complete sentences, defined symbols and a legible structure.

Full Mock 1 includes

- all mock questions
- full answer spaces
- detailed model answers
- point-by-point grading scheme
- partial-credit guidance
- accepted alternative approaches where applicable

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