



QUESTION WORKBOOK

Non-parametric tests

Further Statistics 2 · Year FM

7 questions · 33 marks

PRINT EDITION

Every question in this book has a code beside its number.
Type inklearning.co.uk/q/ followed by the code to open that question online.
© 2026 Ink Learning Ltd. All rights reserved.
inklearning.co.uk/maths/ · youtube.com/@InkPhysics

SECTION A · Warm-up**A1**
NP-A1

State what makes a hypothesis test non-parametric, and give one situation in which you would prefer such a test to a t-test.

[2]

A2
NP-A2

A supplier claims the median mass of its bags of compost is 25 kg. Eleven bags are weighed and nine of them exceed 25 kg, with none equal to it. Carry out a sign test at the 5% level of the claim against the alternative that the median mass exceeds 25 kg.

[3]

SECTION B · Standard**B1**
NP-B1

Name the non-parametric test you would use in each case, with a reason. (a) The house prices of 9 properties sold in one town and 9 sold in another are compared for a difference in level. (b) Twelve judges each taste two wines and say which of the two they prefer. (c) A single sample of 15 reaction times, from a population known to be skewed, is tested against a claimed median.

[3]

B2
NP-B2

A machine is claimed to fill tubs to a median of 50 g. Nine tubs contain 52.4, 49.3, 55.3, 47.9, 53.8, 49.2, 51.5, 56.4 and 55.1 g. Use a Wilcoxon signed-rank test at the 5% level to test the claim against the alternative that the median exceeds 50 g. The critical value is 8. [6]

B3
NP-B3

Ten operators are timed on a task before and after their workstation is rearranged. The numbers of units produced before are 42, 55, 38, 61, 47, 50, 44, 58, 36, 53, and afterwards 56, 52, 60, 68, 45, 61, 62, 53, 62, 62. State whether the samples are paired or independent, and test at the 5% level whether output has risen, using a Wilcoxon matched-pairs signed-rank test. The critical value is 10. [6]

SECTION C · Stretch

C1
NP-C1

Six plots given fertiliser A yield 12, 15, 18, 23, 26 and 37 kg; eight independent plots given fertiliser B yield 21, 29, 31, 34, 40, 43, 46 and 52 kg. Test at the 5% level, in two tails, whether the two fertilisers give the same distribution of yields. The critical values are 29 and 61.

[7]

C2
NP-C2

Twenty-five paired differences are ranked by size and the negative ranks total 95. The table of critical values does not extend to $n = 25$. Use a normal approximation, with a continuity correction, to test at the 5% level in one tail whether the median difference is positive. State also what difference the continuity correction makes here.

[6]

THIS BOOK ONLINE

Scan the code, or type the address, to open the questions in this book online:

inklearning.co.uk/maths/practise/questions/non-parametric-tests/