

Pearson Edexcel Level 3 GCE

May–June 2026 Assessment Window & Beyond

Syllabus
reference

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Psychology

Advanced and Advanced Subsidiary
Formulae and Statistical Tables

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FORMULAE AND STATISTICAL TABLES

Standard deviation (sample estimate)

$$\sqrt{\left(\frac{\sum(x-\bar{x})^2}{n-1}\right)}$$

Spearman's rank correlation coefficient

$$1 - \frac{6\sum d^2}{n(n^2-1)}$$

Critical values for Spearman's rank

| N | Level of significance for a one-tailed test | | | | |
|----|---|-------|-------|-------|--------|
| | 0.05 | 0.025 | 0.01 | 0.005 | 0.0025 |
| | Level of significance for a two-tailed test | | | | |
| | 0.10 | 0.05 | 0.025 | 0.01 | 0.005 |
| 5 | 0.900 | 1.000 | 1.000 | 1.000 | 1.000 |
| 6 | 0.829 | 0.886 | 0.943 | 1.000 | 1.000 |
| 7 | 0.714 | 0.786 | 0.893 | 0.929 | 0.964 |
| 8 | 0.643 | 0.738 | 0.833 | 0.881 | 0.905 |
| 9 | 0.600 | 0.700 | 0.783 | 0.833 | 0.867 |
| 10 | 0.564 | 0.648 | 0.745 | 0.794 | 0.830 |
| 11 | 0.536 | 0.618 | 0.709 | 0.755 | 0.800 |
| 12 | 0.503 | 0.587 | 0.678 | 0.727 | 0.769 |
| 13 | 0.484 | 0.560 | 0.648 | 0.703 | 0.747 |
| 14 | 0.464 | 0.538 | 0.626 | 0.679 | 0.723 |
| 15 | 0.446 | 0.521 | 0.604 | 0.654 | 0.700 |
| 16 | 0.429 | 0.503 | 0.582 | 0.635 | 0.679 |
| 17 | 0.414 | 0.485 | 0.566 | 0.615 | 0.662 |
| 18 | 0.401 | 0.472 | 0.550 | 0.600 | 0.643 |
| 19 | 0.391 | 0.460 | 0.535 | 0.584 | 0.628 |
| 20 | 0.380 | 0.447 | 0.520 | 0.570 | 0.612 |
| 21 | 0.370 | 0.435 | 0.508 | 0.556 | 0.599 |
| 22 | 0.361 | 0.425 | 0.496 | 0.544 | 0.586 |
| 23 | 0.353 | 0.415 | 0.486 | 0.532 | 0.573 |
| 24 | 0.344 | 0.406 | 0.476 | 0.521 | 0.562 |
| 25 | 0.337 | 0.398 | 0.466 | 0.511 | 0.551 |
| 26 | 0.331 | 0.390 | 0.457 | 0.501 | 0.541 |
| 27 | 0.324 | 0.382 | 0.448 | 0.491 | 0.531 |
| 28 | 0.317 | 0.375 | 0.440 | 0.483 | 0.522 |
| 29 | 0.312 | 0.368 | 0.433 | 0.475 | 0.513 |
| 30 | 0.306 | 0.362 | 0.425 | 0.467 | 0.504 |

The calculated value must be equal to or exceed the critical value in this table for significance to be shown.

Chi-squared distribution formula

$$X^2 = \sum \frac{(O-E)^2}{E} \quad df = (r-1)(c-1)$$

Critical values for chi-squared distribution

| Level of significance for a one-tailed test | | | | | | |
|---|-------|-------|-------|-------|--------|--------|
| | 0.10 | 0.05 | 0.025 | 0.01 | 0.005 | 0.0005 |
| Level of significance for a two-tailed test | | | | | | |
| df | 0.20 | 0.10 | 0.05 | 0.025 | 0.01 | 0.001 |
| 1 | 1.64 | 2.71 | 3.84 | 5.02 | 6.64 | 10.83 |
| 2 | 3.22 | 4.61 | 5.99 | 7.38 | 9.21 | 13.82 |
| 3 | 4.64 | 6.25 | 7.82 | 9.35 | 11.35 | 16.27 |
| 4 | 5.99 | 7.78 | 9.49 | 11.14 | 13.28 | 18.47 |
| 5 | 7.29 | 9.24 | 11.07 | 12.83 | 15.09 | 20.52 |
| 6 | 8.56 | 10.65 | 12.59 | 14.45 | 16.81 | 22.46 |
| 7 | 9.80 | 12.02 | 14.07 | 16.01 | 18.48 | 24.32 |
| 8 | 11.03 | 13.36 | 15.51 | 17.54 | 20.09 | 26.12 |
| 9 | 12.24 | 14.68 | 16.92 | 19.02 | 21.67 | 27.88 |
| 10 | 13.44 | 15.99 | 18.31 | 20.48 | 23.21 | 29.59 |
| 11 | 14.63 | 17.28 | 19.68 | 21.92 | 24.73 | 31.26 |
| 12 | 15.81 | 18.55 | 21.03 | 23.34 | 26.22 | 32.91 |
| 13 | 16.99 | 19.81 | 22.36 | 24.74 | 27.69 | 34.53 |
| 14 | 18.15 | 21.06 | 23.69 | 26.12 | 29.14 | 36.12 |
| 15 | 19.31 | 22.31 | 25.00 | 27.49 | 30.58 | 37.70 |
| 16 | 20.47 | 23.54 | 26.30 | 28.85 | 32.00 | 39.25 |
| 17 | 21.62 | 24.77 | 27.59 | 30.19 | 33.41 | 40.79 |
| 18 | 22.76 | 25.99 | 28.87 | 31.53 | 34.81 | 42.31 |
| 19 | 23.90 | 27.20 | 30.14 | 32.85 | 36.19 | 43.82 |
| 20 | 25.04 | 28.41 | 31.41 | 34.17 | 37.57 | 45.32 |
| 21 | 26.17 | 29.62 | 32.67 | 35.48 | 38.93 | 46.80 |
| 22 | 27.30 | 30.81 | 33.92 | 36.78 | 40.29 | 48.27 |
| 23 | 28.43 | 32.01 | 35.17 | 38.08 | 41.64 | 49.73 |
| 24 | 29.55 | 33.20 | 36.42 | 39.36 | 42.98 | 51.18 |
| 25 | 30.68 | 34.38 | 37.65 | 40.65 | 44.31 | 52.62 |
| 26 | 31.80 | 35.56 | 38.89 | 41.92 | 45.64 | 54.05 |
| 27 | 32.91 | 36.74 | 40.11 | 43.20 | 46.96 | 55.48 |
| 28 | 34.03 | 37.92 | 41.34 | 44.46 | 48.28 | 56.89 |
| 29 | 35.14 | 39.09 | 42.56 | 45.72 | 49.59 | 58.30 |
| 30 | 36.25 | 40.26 | 43.77 | 46.98 | 50.89 | 59.70 |
| 40 | 47.27 | 51.81 | 55.76 | 59.34 | 63.69 | 73.40 |
| 50 | 58.16 | 63.17 | 67.51 | 71.42 | 76.15 | 86.66 |
| 60 | 68.97 | 74.40 | 79.08 | 83.30 | 88.38 | 99.61 |
| 70 | 79.72 | 85.53 | 90.53 | 95.02 | 100.43 | 112.32 |

The calculated value must be equal to or exceed the critical value in this table for significance to be shown.

Mann-Whitney U test formulae

$$U_a = n_a n_b + \frac{n_a(n_a + 1)}{2} - \sum R_a$$

$$U_b = n_a n_b + \frac{n_b(n_b + 1)}{2} - \sum R_b$$

(U is the smaller of U_a and U_b)

Critical values for the Mann-Whitney U test

p ≤ 0.05 (one-tailed), p ≤ 0.10 (two-tailed)

| N _a | N _b | | | | | | | | | | | | | | | |
|----------------|----------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 5 | 4 | 5 | 6 | 8 | 9 | 11 | 12 | 13 | 15 | 16 | 18 | 19 | 20 | 22 | 23 | 25 |
| 6 | 5 | 7 | 8 | 10 | 12 | 14 | 16 | 17 | 19 | 21 | 23 | 25 | 26 | 28 | 30 | 32 |
| 7 | 6 | 8 | 11 | 13 | 15 | 17 | 19 | 21 | 24 | 26 | 28 | 30 | 33 | 35 | 37 | 39 |
| 8 | 8 | 10 | 13 | 15 | 18 | 20 | 23 | 26 | 28 | 31 | 33 | 36 | 39 | 41 | 44 | 47 |
| 9 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 | 48 | 51 | 54 |
| 10 | 11 | 14 | 17 | 20 | 24 | 27 | 31 | 34 | 37 | 41 | 44 | 48 | 51 | 55 | 58 | 62 |
| 11 | 12 | 16 | 19 | 23 | 27 | 31 | 34 | 38 | 42 | 46 | 50 | 54 | 57 | 61 | 65 | 69 |
| 12 | 13 | 17 | 21 | 26 | 30 | 34 | 38 | 42 | 47 | 51 | 55 | 60 | 64 | 68 | 72 | 77 |
| 13 | 15 | 19 | 24 | 28 | 33 | 37 | 42 | 47 | 51 | 56 | 61 | 65 | 70 | 75 | 80 | 84 |
| 14 | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 | 66 | 71 | 77 | 82 | 87 | 92 |
| 15 | 18 | 23 | 28 | 33 | 39 | 44 | 50 | 55 | 61 | 66 | 72 | 77 | 83 | 88 | 94 | 100 |
| 16 | 19 | 25 | 30 | 36 | 42 | 48 | 54 | 60 | 65 | 71 | 77 | 83 | 89 | 95 | 101 | 107 |
| 17 | 20 | 26 | 33 | 39 | 45 | 51 | 57 | 64 | 70 | 77 | 83 | 89 | 96 | 102 | 109 | 115 |
| 18 | 22 | 28 | 35 | 41 | 48 | 55 | 61 | 68 | 75 | 82 | 88 | 95 | 102 | 109 | 116 | 123 |
| 19 | 23 | 30 | 37 | 44 | 51 | 58 | 65 | 72 | 80 | 87 | 94 | 101 | 109 | 116 | 123 | 130 |
| 20 | 25 | 32 | 39 | 47 | 54 | 62 | 69 | 77 | 84 | 92 | 100 | 107 | 115 | 123 | 130 | 138 |

$p \leq 0.025$ (one-tailed), $p \leq 0.05$ (two-tailed)

| N_a | N_b | | | | | | | | | | | | | | | |
|-------|-------|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 5 | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 20 |
| 6 | 3 | 5 | 6 | 8 | 10 | 11 | 13 | 14 | 16 | 17 | 19 | 21 | 22 | 24 | 25 | 27 |
| 7 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| 8 | 6 | 8 | 10 | 13 | 15 | 17 | 19 | 22 | 24 | 26 | 29 | 31 | 34 | 36 | 38 | 41 |
| 9 | 7 | 10 | 12 | 15 | 17 | 20 | 23 | 26 | 28 | 31 | 34 | 37 | 39 | 42 | 45 | 48 |
| 10 | 8 | 11 | 14 | 17 | 20 | 23 | 26 | 29 | 33 | 36 | 39 | 42 | 45 | 48 | 52 | 55 |
| 11 | 9 | 13 | 16 | 19 | 23 | 26 | 30 | 33 | 37 | 40 | 44 | 47 | 51 | 55 | 58 | 62 |
| 12 | 11 | 14 | 18 | 22 | 26 | 29 | 33 | 37 | 41 | 45 | 49 | 53 | 57 | 61 | 65 | 69 |
| 13 | 12 | 16 | 20 | 24 | 28 | 33 | 37 | 41 | 45 | 50 | 54 | 59 | 63 | 67 | 72 | 76 |
| 14 | 13 | 17 | 22 | 26 | 31 | 36 | 40 | 45 | 50 | 55 | 59 | 64 | 67 | 74 | 78 | 83 |
| 15 | 14 | 19 | 24 | 29 | 34 | 39 | 44 | 49 | 54 | 59 | 64 | 70 | 75 | 80 | 85 | 90 |
| 16 | 15 | 21 | 26 | 31 | 37 | 42 | 47 | 53 | 59 | 64 | 70 | 75 | 81 | 86 | 92 | 98 |
| 17 | 17 | 22 | 28 | 34 | 39 | 45 | 51 | 57 | 63 | 67 | 75 | 81 | 87 | 93 | 99 | 105 |
| 18 | 18 | 24 | 30 | 36 | 42 | 48 | 55 | 61 | 67 | 74 | 80 | 86 | 93 | 99 | 106 | 112 |
| 19 | 19 | 25 | 32 | 38 | 45 | 52 | 58 | 65 | 72 | 78 | 85 | 92 | 99 | 106 | 113 | 119 |
| 20 | 20 | 27 | 34 | 41 | 48 | 55 | 62 | 69 | 76 | 83 | 90 | 98 | 105 | 112 | 119 | 127 |

$p \leq 0.01$ (one-tailed), $p \leq 0.02$ (two-tailed)

| N_a | N_b | | | | | | | | | | | | | | | |
|-------|-------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 6 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 11 | 12 | 13 | 15 | 16 | 18 | 19 | 20 | 22 |
| 7 | 3 | 4 | 6 | 7 | 9 | 11 | 12 | 14 | 16 | 17 | 19 | 21 | 23 | 24 | 26 | 28 |
| 8 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 |
| 9 | 5 | 7 | 9 | 11 | 14 | 16 | 18 | 21 | 23 | 26 | 28 | 31 | 33 | 36 | 38 | 40 |
| 10 | 6 | 8 | 11 | 13 | 16 | 19 | 22 | 24 | 27 | 30 | 33 | 36 | 38 | 41 | 44 | 47 |
| 11 | 7 | 9 | 12 | 15 | 18 | 22 | 25 | 28 | 31 | 34 | 37 | 41 | 44 | 47 | 50 | 53 |
| 12 | 8 | 11 | 14 | 17 | 21 | 24 | 28 | 31 | 35 | 38 | 42 | 46 | 49 | 53 | 56 | 60 |
| 13 | 9 | 12 | 16 | 20 | 23 | 27 | 31 | 35 | 39 | 43 | 47 | 51 | 55 | 59 | 63 | 67 |
| 14 | 10 | 13 | 17 | 22 | 26 | 30 | 34 | 38 | 43 | 47 | 51 | 56 | 60 | 65 | 69 | 73 |
| 15 | 11 | 15 | 19 | 24 | 28 | 33 | 37 | 42 | 47 | 51 | 56 | 61 | 66 | 70 | 75 | 80 |
| 16 | 12 | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 | 66 | 71 | 76 | 82 | 87 |
| 17 | 13 | 18 | 23 | 28 | 33 | 38 | 44 | 49 | 55 | 60 | 66 | 71 | 77 | 82 | 88 | 93 |
| 18 | 14 | 19 | 24 | 30 | 36 | 41 | 47 | 53 | 59 | 65 | 70 | 76 | 82 | 88 | 94 | 100 |
| 19 | 15 | 20 | 26 | 32 | 38 | 44 | 50 | 56 | 63 | 69 | 75 | 82 | 88 | 94 | 101 | 107 |
| 20 | 16 | 22 | 28 | 34 | 40 | 47 | 53 | 60 | 67 | 73 | 80 | 87 | 93 | 100 | 107 | 114 |

$p \leq 0.005$ (one-tailed), $p \leq 0.01$ (two-tailed)

| N_a | N_b | | | | | | | | | | | | | | | |
|-----------|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 5 | 0 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 11 | 12 | 13 | 15 | 16 | 17 | 18 |
| 7 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 21 | 22 | 24 |
| 8 | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 9 | 3 | 5 | 7 | 9 | 11 | 13 | 16 | 18 | 20 | 22 | 24 | 27 | 29 | 31 | 33 | 36 |
| 10 | 4 | 6 | 9 | 11 | 13 | 16 | 18 | 21 | 24 | 26 | 29 | 31 | 34 | 37 | 39 | 42 |
| 11 | 5 | 7 | 10 | 13 | 16 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 | 48 |
| 12 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 31 | 34 | 37 | 41 | 44 | 47 | 51 | 54 |
| 13 | 7 | 10 | 13 | 17 | 20 | 24 | 27 | 31 | 34 | 38 | 42 | 45 | 49 | 53 | 56 | 60 |
| 14 | 7 | 11 | 15 | 18 | 22 | 26 | 30 | 34 | 38 | 42 | 46 | 50 | 54 | 58 | 63 | 67 |
| 15 | 8 | 12 | 16 | 20 | 24 | 29 | 33 | 37 | 42 | 46 | 51 | 55 | 60 | 64 | 69 | 73 |
| 16 | 9 | 13 | 18 | 22 | 27 | 31 | 36 | 41 | 45 | 50 | 55 | 60 | 65 | 70 | 74 | 79 |
| 17 | 10 | 15 | 19 | 24 | 29 | 34 | 39 | 44 | 49 | 54 | 60 | 65 | 70 | 75 | 81 | 86 |
| 18 | 11 | 16 | 21 | 26 | 31 | 37 | 42 | 47 | 53 | 58 | 64 | 70 | 75 | 81 | 87 | 92 |
| 19 | 12 | 17 | 22 | 28 | 33 | 39 | 45 | 51 | 56 | 63 | 69 | 74 | 81 | 87 | 93 | 99 |
| 20 | 13 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 67 | 73 | 79 | 86 | 92 | 99 | 105 |

The calculated value must be equal to or less than the critical value in this table for significance to be shown.

Wilcoxon Signed Ranks test process

- Calculate the difference between the scores in each pair by taking one from the other (A-B or B-A will produce the same result, but the order must be the same for every pair)
- Rank the differences giving the smallest difference Rank 1

Note: do not rank any differences of 0 and when counting the number of pairs of scores, do not count those with a difference of 0, and ignore the signs when calculating the rank

- Add up the ranks for positive differences
- Add up the ranks for negative differences
- T is the result that is the smallest when the ranks are totalled (may be the sum of the positive or negative ranks)
- N is the number of pairs of scores, ignore those with 0 difference

Critical values for the Wilcoxon Signed Ranks test

| <i>n</i> | Level of significance for a one-tailed test | | |
|----------|---|-------|------|
| | 0.05 | 0.025 | 0.01 |
| | Level of significance for a two-tailed test | | |
| | 0.1 | 0.05 | 0.02 |
| N=5 | 0 | – | – |
| 6 | 2 | 0 | – |
| 7 | 3 | 2 | 0 |
| 8 | 5 | 3 | 1 |
| 9 | 8 | 5 | 3 |
| 10 | 11 | 8 | 5 |
| 11 | 13 | 10 | 7 |
| 12 | 17 | 13 | 9 |

The calculated value must be equal to or less than the critical value in this table for significance to be shown.



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