# General Mathematics Unit 3 & 4 — Examination 1 (Practice 5) — Answers & Explanations

Answers to the 20 questions in the free preview.

## Data analysis

**1.** A. categorical nominal and numerical discrete

Blood types are labels with no natural order, so blood type is nominal. Nights are counted, so the number of nights is numerical discrete.

**2.** D. 55%

14 + 5 + 3 = 22 people are in the classes from 40 upwards, and 22 ÷ 40 = 55%.

**3.** A. The interquartile range is 8 minutes and the value of 45 minutes lies beyond the upper fence of 38 minutes.

IQR = 26 − 18 = 8, so the upper fence is 26 + 1.5 × 8 = 38, and 45 is an outlier. The range is 45 − 12 = 33, the median is 22, and about 50% of customers lie between the minimum and the median.

**4.** C. 30

38 cm is two standard deviations above the mean, and 2.5% of values lie above that: 0.025 × 1200 = 30.

**5.** C. 76

50% of scores lie below the mean and 34% lie between the mean and one standard deviation above it, so the 84th percentile is 70 + 6 = 76.

**6.** C. 51.2%

There are 105 + 110 = 215 non-smokers, of whom 110 are female: 110 ÷ 215 = 51.2%. 88.0% is the percentage of females who are non-smokers, which answers a different question.

**7.** B. moderate, negative and linear

r between −0.5 and −0.75 is conventionally described as moderate. The points drift downward in a roughly straight band, so the association is negative and linear.

**8.** C. 36%

$r^2 = 0.64$, so 64% of the variation is explained and 100% − 64% = 36% is not.

**9.** A. −3.4

Predicted time = 12.4 + 1.8 × 15 = 39.4. Residual = actual − predicted = 36 − 39.4 = −3.4.

**10.** D. 100

$\log_{10}(y) = 0.5 + 0.3 \times 5 = 2$, so $y = 10^2 = 100$. Stopping at 2 forgets to reverse the transformation.

**11.** A. it is an extrapolation beyond the ages in the data

Age 30 lies well outside the range 2 to 10, and children's growth does not continue linearly into adulthood.

**12.** B. otherwise the average would sit between two time periods

The mean of four consecutive points belongs halfway between the 2nd and 3rd points. Averaging two consecutive four-point means realigns the result with an actual time period.

**13.** B. 0.88

Monthly seasonal indices sum to 12, so the remaining index is 12 − 11.12 = 0.88.

**14.** E. a structural change

The level of the series drops suddenly between months 7 and 8 and stays at the new, lower level, which is a structural change.

**15.** A. yield = −0.1752 + 0.007183 × rainfall

With rainfall as x and yield as y: slope 0.0071831 and intercept −0.17519. The option with rainfall as the response predicts the wrong variable.

PrepNest

**16.** E. 0.998

Using a CAS, r = 0.9977. The coefficient of determination is 0.995, which is $r^2$, not r.

## Recursion and financial modelling

**17.** B. $V_0 = 4000$, $V_{n+1} = V_n + 140$

Simple interest adds the same amount each year: 3.5% of 4000 = $140. Multiplying by 1.035 would model compound interest.

**18.** C. 5 years

$0.85^4 = 0.522$ and $0.85^5 = 0.444$, so the value first drops below $10 000 after 5 years.

**19.** E. 4.95% per annum, compounding quarterly

Effective rates: quarterly 4.95% gives 5.043%; annual 5.00% gives 5.000%; monthly 4.90% gives 5.012%; daily 4.85% gives 4.969%; weekly 4.80% gives 4.914%.

**20.** D. 49

Financial solver: I% = 7.8, PV = 25 000, PMT = −600, FV = 0 gives N = 48.75, so 48 full repayments and a smaller 49th are needed. 25 000 ÷ 600 = 41.7 ignores interest.

PrepNest

PREVIEW

# That’s the end of the preview answers

These are the answers to the 20 preview questions. The full answer key covers all 40 questions in General Mathematics Unit 3 & 4 — Examination 1 (Practice 5), with the working behind every mark.

| STILL TO COME | QUESTIONS | MARKS |
|---|---|---|
| Recursion and financial modelling | 4 | 4 |
| Matrices | 8 | 8 |
| Networks and decision mathematics | 8 | 8 |

**The full paper comes with**

- Every question, printed exactly like the ones in this preview
- The complete answer key, with the working behind every mark
- A topic report after marking, showing what to practice next

Get the full paper at
**prepnest.com.au/practice/exams/general_maths-year_12-5-exam1**