

MATHEMATICS ANSWERS

Level One

“Levelling”

1. (Given here to 4dp – but accept sensible rounding)

Mark	Average
Fundamental	3.2510
Dunedin	1.7287
Birch St	2.7317
Fryatt St	1.7050
Witness	3.4653
Port Chalmers	1.7167
Sleeper	3.6830
BM1 Beach St	2.8110
CGPS MRP	8.0787

2. Fundamental – CGPS MRP $= 3.2510 - 8.0787$
 $= -4.8277\text{m}$

3. Dunedin – Port Chalmers $= 1.7287 - 1.7167$
 $= 0.012\text{m}$

Task Two

1. Differences occur in different methods because of the errors introduced when making the measurements.
2. Reason for the errors could be:
 - a. Not correctly lining up the 1 metre rule
 - b. Not knowing how long your pace is or counting it wrongly
 - c. Stretching the tape, or letting it sag
 - d. EDM measurement errors
 - e. Changing your pace length half way through
 - f. Not allowing for the ends of the ruler which don't have mm marked on that part
 - g. Ground may be uneven so you may be measuring more of a slope distance
3. Most accurate is EDM and least accurate is Jill's pacing
4. Range: $28.3 - 25.72 = 2.58\text{m}$
Median: 25.755
Average/Mean: 26.145
5. Plot the mean, upper quartile and lower quartile. Outliers are beyond this range.