

THE SCHOOL FOR EXCELLENCE (TSFX)
UNITS 3 & 4 MATHEMATICAL METHODS 2020
TRIAL EXAMINATION – ERRATA SHEET

WRITTEN EXAMINATION 1

Question 3b. Solution – Please change the range and answer to the following:

$$\text{ran}(f) = \left(-\frac{3}{4}, +\infty\right) \quad \text{Answer: } \left(-\frac{3}{4}, +\infty\right)$$

WRITTEN EXAMINATION 2

Question 14 – Multiple Choice Section – Exam Paper 2

Please change the multiple choice options to:

- A. 2.34
- B. 2.44
- C. 2.54
- D. 2.64
- E. 2.74

Question 14 – Solutions – Exam Paper 2

- From the VCAA formula sheet: $A = \frac{1}{2}(a+b)h$
- $h = 2\sin(\theta)$ (using triangle CED).
- $a = BC = 1$
- $b = AD = BC + 2ED$ (by symmetry)
 $= 1 + 4\cos(\theta)$ (using triangle CED)
- Therefore:
$$A = \frac{1}{2}(a+b)h = \frac{1}{2}(1+4\cos(\theta))2\sin(\theta) = (1+4\cos(\theta))\sin(\theta)$$
- Use a CAS to solve $\frac{dA}{d\theta} = 0$: $\theta \approx 0.866676$ radians

Therefore, the maximum area is $(1+4\cos(0.866676))\sin(0.866676) \approx 2.73582$