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:

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

  $A = \frac{1}{2}(a+b)h \quad = \frac{1}{2}\left(1+4\cos(\theta)\right)2\sin(\theta) \quad = \left(1+4\cos(\theta)\right)\sin(\theta)$
- Use a CAS to solve $\frac{dA}{d\theta} = 0$: $\theta \approx 0.866676$ radians

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