Ord: ___ ___

Calc 2
MAC2312

Class-D

Prof. JLF King
Touch: 18Mar2017

End of Class-D

Show no work. *NOTE*: Write **DNE** in a blank if the described object does not exist or if the indicated operation cannot be performed. Do ***not*** approx.: If your result is "$\sin(\sqrt{\pi})$" then write that rather than .9797$\cdots$.

D1: ___ ___ ___ 220pts

D2: ___ ___ 75pts

Total: ___ ___ ___ 295pts

HONOR CODE: *"I have neither requested nor received help on this exam other than from my professor (or his colleague)."*
Name/Signature/Ord

Ord:

D1:

___ z A series $\sum_{k=3}^{\infty} a_k$ is ***absolutely convergent*** if

. An example of an $\mathbb{R}$-convergent series that is **not** abs.conv, has k^{th} term $a_k :=$.

___ a *One lobe* of polar-curve $r = 6 \cdot \cos(3\theta)$, has area $\int$ [ ] $\cdot \, d\theta$.

___ b $\sum_{k=5}^{50} 8^k = \frac{N}{D}$, where $N=$, $D=$.

___ c Let $b_n := \mathsf{e}^{4/[n+5]} \overset{\text{note}}{=\!=} \exp(\frac{4}{n+5})$. Then $\sum_{n=3}^{\infty} [b_n - b_{n+1}] =$.

[*Hint:* A real, $+\infty$, $-\infty$ or **DNEin**$\overline{\mathbb{R}}$.]

___ d The Mac of $\dfrac{4 \cdot x}{2 + x^2}$ has RoC= .

Mac$(x)=$.

Write the first 5 non-zero terms, e.g, $8x^3 + \frac{1}{8}x^6 + \frac{3}{2}x^8 - x^{12} - 7x^{15} + \cdots$.

D2: "Water" on planet *Light* has density $7\,\frac{\mathsf{lb}}{\mathsf{ft}^3}$. A dam $\mathbf{T}$=$\mathbf{T}_B$, in form of an isosceles trapezoid, has base width $B :: \mathsf{ft}$, top width $50\mathsf{ft} + B$ (of the parallel edge), and slant-height $65\mathsf{ft}$. So $H :=$

(an *integer*) is the dam's height. In terms of H,B and $50\mathsf{ft}$,
Area($\mathbf{T}$)= . [Verified *units*?]
Geometrically, $\lim_{B \nearrow \infty} Y_B =$ and $Y_0 =$,
where $Y_B \overset{\text{note}}{=\!=}$

denotes how far Centroid($\mathbf{T}$) lies *below* Top($\mathbf{T}$).

Water comes just to the top of $\mathbf{T}$. Hence the total hydrostatic force on $\mathbf{T}$ is (ITOf H,B, $50\mathsf{ft}$ and $7\mathsf{lb}/\mathsf{ft}^3$)

$F_B :=$ [ ] $\cdot \, \mathsf{lb}$.