Hello.   Please write **DNE** in a blank <u>if</u> the described object does not exist or if the indicated operation cannot be performed.   **Write expressions unambiguously e.g, "$1/a+b$" should be bracketed either $[1/a]+b$ or $1/[a+b]$. (Be careful with negative signs!)**

Do *not* approx.: If your result is "$\sin(\sqrt{\pi})$" then write that rather than $.9797\cdots$.

Use "$f(x)$ notation" when writing fncs; in particular, for trig and log fncs. E.g, write "$\sin(x)$" rather than the horrible $\sin x$ or $[\sin x]$.

Write *rational numbers* as fractions: E.g $\frac{1}{2}$ and $1/3$, but not 0.5 nor $0.3333\ldots$; **use fractions**.

A4: Show no work.

a Fnc $y_\beta(t) :=$ ....

is the general soln to $\frac{dy}{dt} = 8t^3 \cdot [y-5]$. [*Hint:* SoV.]

The *particular* $y()$ with $y(0) = 8$ is

$y(t) :=$ .... And this

function has $y(1) =$ ....

b Function $h()$ satisfies $2h'' + h' - 6h = 0$,

and initial conditions $\boxed{h(0) = 5}$ and $\boxed{h'(0) = -3}$. So

$$h(t) = \alpha e^{At} + \beta e^{Bt}, \text{ for numbers}$$

$\alpha=$ .... , $A=$ .... , $\beta=$ .... , $B=$ ....

c Fnc $y_\alpha(t) :=$ ....

is the general soln to $y' + \left[\dfrac{2}{t} \cdot y\right] = t^3$. [*Hint:* FOLDE.]

A5: Show no work.

d DiffOperators $\mathbf{P}, \mathbf{Q}, \mathbf{R}, \mathbf{S}$ are defined as

$$\mathbf{P}(f) := f(3) \cdot f', \qquad \mathbf{Q}(f) := \cos(3) \cdot f^{(3)},$$
$$\mathbf{R}(f) := [\cos(3){\cdot}f] + f'', \quad \mathbf{S}(f) := \cos(3) + [3f'].$$

Then . . .   **P** *is linear:* T F.   **Q** *is linear:* T F.

R *is linear:* T F.   **S** *is linear:* T F.

e The discriminant of polynomial

$f(x) := 3x^2 + 3x + 1$ is $\operatorname{Discr}(f) =$ ....

f Blanks$\in\mathbb{R}$. So $\frac{1}{1-3i}=$ .... $+i\cdot$ $\left[.......... \right]$.

Thus $\dfrac{-2+5i}{1-3i} =$ .... $+i\cdot$ $\left[............ \right]$.

By the way, $|{-4}+5i| =$ ....

End of A-Class

A4:	__ __ __	120pts
A5:	__ __	65pts
Total:	__ __ __	185pts