

Math 202 Quiz # 4

Name: Solution Section # _____ Serial # _____

Find a suitable annihilator for each of the following:

1. $f(x) = 4x^2 \cos 5x + 9x$

$$\underbrace{(D^2+25)^3}_{\substack{\downarrow \\ D^2}} \Rightarrow D^2(D^2+25)^3$$

2. $g(x) = x^4 e^{-x} + x$

$$\underbrace{(D+1)^5}_{\substack{\downarrow \\ D^2}} \Rightarrow D^2(D+1)^5$$

3. $h(x) = 1 + x e^{3x} \sin 2x + \cos x$

$$\underbrace{D}_{\substack{\downarrow \\ D}} \underbrace{(D^2-6D+13)^2}_{\substack{\downarrow \\ (D^2+1)}} \Rightarrow D(D^2+1)(D^2-6D+13)^2$$

Math 202 Quiz # 4b

Name: Solution Section # _____ Serial # _____

Find a suitable annihilator for each of the following:

1. $f(x) = x^5 e^{-x} - x$

$$\underbrace{(D+1)^6}_{\substack{\downarrow \\ D^2}} \Rightarrow D^2(D+1)^6$$

2. $f(x) = 4x^3 \cos 3x + 5x$

$$\underbrace{(D^2+9)^4}_{\substack{\downarrow \\ D^2}} \Rightarrow D^2(D^2+9)^4$$

3. $h(x) = 1 + x e^{5x} \sin 2x + \cos x$

$$\underbrace{D}_{\substack{\downarrow \\ D}} \underbrace{(D^2-10D+29)^2}_{\substack{\downarrow \\ (D^2+1)}} \Rightarrow D(D^2+1)(D^2-10D+29)^2$$