

12:35pm

06/01/21

ACHA4000

1910311 (Jacob James)

Q3

9

$$(i) \int (x^5 - 2x)(5x^3 + 6x) dx$$

$$= \int 5x^8 + 6x^6 - 10x^4 - 12x^2 dx$$

$$= \int 5x^8 dx + \int 6x^6 dx - \int 10x^4 dx - \int 12x^2 dx$$

$$= \frac{5x^9}{9} + \frac{6x^7}{7} - 2x^5 - 4x^3$$

$$= \frac{5x^9}{9} + \frac{6x^7}{7} - 2x^5 - 4x^3 + C$$

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Q2

a) $z_1 = 3+7j$, $z_2 = 2-10j$ and $z_3 = -4-j$

i) $z_1 + z_3 = (3+7j) + (-4-j)$
 $= 3+7j-4-j$
 $= 7j-j+3-4$
 $= 6j+3-4$
 $= \underline{6j-1}$

ii) $z_1 - z_3 = (3+7j) - (-4-j)$
 $= 3+7j+4+j$
 $= \underline{8j+7}$

iii) $\frac{z_1}{z_2} = \frac{3+7j}{2-10j}$
 $= \frac{7j+3}{-10j+2} = -\frac{7}{10} + \frac{\frac{22}{5}}{-10j+2}$
 $= -\frac{7}{10} + \frac{11}{5(-5j+1)}$