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2E1

HOMEWORK I

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9th Edition

1/ $T = x(e^y + e^{-y})$ where x and y are found to be 2 and $\log_e 2$ respectively. If the error in x is 0.1 and in y is 0.02. Estimate max possible error in T

2/ If $r = 5.0$ cm. and $h = 12.0$ cm. correct to the nearest millimetre find the max. % error in calculating $V = \pi r^2 h$ TF p. 942 Q 15, 17

3/ Calculate $\frac{dw}{dt}$ as a function of t if

- i) $w = x^2 + y^2$, $x = \cos t$, $y = \sin t$
- ii) $w = \frac{x}{z} + \frac{y}{z}$, $x = \cos^2 t$, $y = \sin^2 t$
- iii) $w = 2ye^x - \log_e z$, $x = \log_e(t^2 + 1)$, $y = \tan^{-1} t$

TF p. 950 Q 1, 3, 5

4/ Calculate the gradient of f at the point P_0 and find the directions in which the function increase and decrease most rapidly.

- i) $f = x^2 + xy + y^2$ $P_0(-1, 1)$ ii) $f = \log_e xy + \log_e yz + \log_e zx$ $P_0(1, 1, 1)$

TF p. 967 Q 17, 21 / TF p. 967 Q 27, 29

5/ Find the ~~normal~~ normal vector and the eqⁿ of the tangent plane at P_0 for the surfaces (a) $x^2 + y^2 + z^2 = 2$ (1, 1, 1) (b) $2z - x^2 = 0$ (2, 0, 2)