INDIAN SCHOOL DARSAIT

Class XII — **Mathematics Worksheet**

Worksheet # 15 Application of Derivatives # 4

Errors & Approximations

(Chapter – 6 : Application of Derivatives)

CLASS WORK

Use differential to approximate the following

1.	i) $\sqrt{36.6}$ ii) $\sqrt{0.6}$ iii) $\sqrt{36.6}$ iv) $(0.009)^{\frac{1}{3}}$ v) $255^{1/4}$ vi) $82^{1/4}$ viii) $(26.57)^{1/3}$ ix) $(3.968)^{3/2}$ x) $(32.15)^{1/5}$ xi) $\left(\frac{17}{81}\right)^{\frac{1}{4}}$
2.	Use differentials to find the approximate value of $\log_e(4.01)$ having given that $\log_e 4 = 1.3863$
3.	Use differentials to find the approximate value of $\text{Tan}\,46^\circ$ if it is given that $1^\circ = 0.01745$ Radians.
4.	Find the approximate value of f(2.01), where f(x) = $4x^2 + 5x + 2$.
5.	Find the approximate value of f(5.001), where f(x) = $x^3 – 7x2 + 15$.
6.	Find the approximate change in the volume V of a cube of side x meters caused by increasing the side by 2%.
7.	Find the approximate change in the volume V of a cube of side x metres caused by increasing the side by 1%.
8.	Find the approximate change in the surface area of a cube of side x metres caused by decreasing the side by 1%

HOME WORK

Use differential to approximate the following

9.	i) $\sqrt{81.4}$ ii) $(33)^{\frac{1}{5}}$ iii) $(26)^{\frac{1}{3}}$ iv) $(0.0037)^{1/2}$ v) $(81.5)^{1/4}$
10.	If f(x) = $3x^2 + 15x + 5$, then the approximate value of f (3.02)
11.	Find the approximate value of f(3.02), where f(x) = $3x^2 + 5x + 3$.
12.	If the radius of a sphere is measured as 9 cm with an error of 0.03 cm, then find the approximate error in calculating its volume.
13.	If the radius of a sphere is measured as 7 m with an error of 0.02 m, then find the approximate error in calculating its volume.