

**KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION**  
**MATHS WORKSHEET I 2023-24**  
**CLASS: XII**  
**CHAPTER : APPLICATION OF DERIVATIVES**

<b>MCQS</b>	
Q1	The function $f(x) = ax + b$ is strictly decreasing for all $x \in \mathbb{R}$ iff: (a) $a = 0$ (b) $a < 0$ (c) $a > 0$ (d) none of these)
Q2	The rate of change of the area of a circle with respect to its radius $r$ at $r = 6$ cm is (a) $10\pi$ (b) $12\pi$ (c) $8\pi$ (d) $11\pi$
Q3	The function $f(x) = \cos x - \sin x$ has maximum or minimum value at $x =$ (a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{4}$ (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{3}$
Q4	Which of the following functions is decreasing on $(0, \pi/2)$ (a) $\sin 2x$ (b) $\tan x$ (c) $\cos x$ (d) $\cos 3x$
Q 5	A cylindrical vessel of radius 0.5 m is filled with oil at the rate of $0.25\pi$ cu/min. The rate at which oil is rising is (a) 1m/min (b) 2m/min (c) 5m/min (d) 1.25 m/min
Note:	For Q No 6 to 10 use separate sheet to solve and attach with worksheet.
Q 6	Sand is pouring from a pipe at the rate of $12 \text{ cm}^3/\text{s}$ . The falling sand forms a cone on the ground in such a way that the height of the cone

	is always one-sixth of the radius of the base. How fast is the height of the sand cone increasing when the height is 4 cm?
Q 7	Find the local maxima and local minima ,if any of the function $f(x)$ , given by $f(x)=\sin x+ \cos x$ , $0<x<\pi/2$ .
Q 8	The relation between the height of the plant( $y$ in cm) with respect to exposure to sunlight is governed by the following equation $y=4x-\frac{1}{2}x^2$ where $x$ is the number of days exposed to sunlight. What will be the rate of growth of the plant with respect to sunlight ?
Q 9	Find the values of $x$ for which $y=[x(x-2)]^2$ is an increasing function
Q10	A wire of length 28 m is to be cut into two pieces. One of the pieces is to be made into a square and the other into a circle. What should be the length of the two pieces so that the combined area of the square and the circle is minimum?
	<b><u>Space for Rough Work</u></b>