

CLASS XII MATHS APPLICATION OF DERIVATIVES

DERIVATIVE AS A RATE MEASURE

1. Find the rate of change of the area of a circle with respect to its radius r when r=6cm.

2. A stone is dropped into a quite lake & the waves in circles .If the radius of a circular wave increases at the rate of 4cm/sec, find the rate of increase in its area at the instant when its radius is 10 cm.

3. A spherical soap bubble is expanding so that its radius is increasing at the rate of 0.02cm/sec.At what rate is the surface area increasing when its radius is 5 cm?

4. The volume of a spherical balloon is increasing at the rate of $20 \text{cm}^3/\text{sec}$. Find the rate of change of its surface area at the instant when its radius is 8cm.

5.The surface area of a spherical balloon is increasing at $2\text{cm}^2/\text{sec}$. At what rate is the volume of the bubble increasing when the radius of the bubble is 6 cm?

6.The volume of a cube is increasing at the rate of 7 cm^3 /sec.How fast is its surface area increasing at the instant when the length of an edge of the cube is 12 cm?

7. The length x of a rectangle is decreasing at the rate of 5 cm/min. When x=8cm & y=6 cm , find the rate of change of (i) the perimeter &(ii) the area of the rectangle.

8.Water is leaking from a conical funnel at the rate of $5 \text{ cm}^3/\text{sec}$. If the radius of the base of the funnel is 5 cm & its altitude is 10 cm, find the rate at which the water level is dropping when it is 2.5 cm from the top.

9.Sand is pouring from a pipe at the rate of 12 cm^3 /sec. The falling sand forms a cone on the ground in such a way that the height of the cone is always $1/6^{\text{th}}$ of the radius of the base. How fast is the height of the sand cone increasing, when the height is 4cm?

 CBSE Sample Papers
 CBSE Guess Papers
 CBSE Practice Papers
 Important Questions
 CBSE PSA
 CBSE

 OTBA
 Proficiency Test
 10 Years Question Bank
 CBSE Guide
 CBSE Syllabus
 Indian Tutors
 Teacher' Jobs

 CBSE eBooks
 Schools
 Alumni
 CBSE Results
 CBSE Datesheet
 CBSE News



10.A 5 cm long ladder is leaning against a wall .The bottom of the ladder is pulled along the ground , away from the wall at the rate of 2m/sec.How fast is its height on the wall decreasing when the foot of the ladder is 4 cm away from the wall?

11. The two equal sides of an isosceles triangle with fixed base b cm are decreasing at the rate of 3 cm/sec. How fast is the area decreasing when each of the equal sides is equal to the base?

12.A point source of light along straight road is at a height of a metres in height is walking along the road .How fast is his shadow increasing if he is walking away from the light at the rate of c meters per minute?

13.A man 160 cm tall ,walks away from a source of light situated at the top of a pole 6 m high , at the rate of 1.1 m/s. How fast is the length of his shadow increasing when he is 1 m away from the pole?

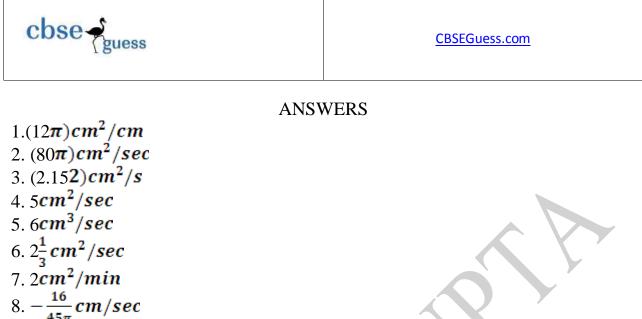
14.A particle moves along the curve $6y=x^3+2$.Find the points on the curve at which the y-coordinate is changing 8 times as fast as the x-coordinate.

15. Find the points on the curve $y^2=8x$ for which the abscissa & ordinate change at the same rate .

16.At what points of the ellipse $16x^2+9y^2=400$ does the ordinate decrease at the same rate at which the abscissa increase?

17. The total cost C(x) of producing x items in a firm is given by C(x) = $0.005x^3$ - $0.02x^2 + 30x + 6000$.

18. The total revenue received from the sale of x units of a product is given by $R(x)=3x^2+40x+10$. Find marginal revenue when x=5.



8. $-\frac{16}{45\pi}$ cm/sec 9. $\frac{1}{48\pi}$ cm/sec 10.(8/3) m/sec 11. $\sqrt{3}$ b 12. $\frac{bc}{(a-b)}$ m/min 13.0.4 m/sec 14. (4,11) and (-4,-31/3) 15.(2,4) 16. (3,16/3)&(-3,-16/3) 17.Rs. 30.08 18. Rs. 70

By:-Prateek Gupta

Mob No.9716183835