CONTINUITY AND DIFFERENTIABILITY

DERIVATIVES OF FUNCTIONS IN PARAMETRIC FORMS

EXERCISE

Q.1 Given $x = 3a^2 \cos^2 \theta$ and $y = 4a\sin^2 \theta$ then find $\frac{dy}{dx}$

(a) $\frac{3}{4a}$ (b) $-\frac{4}{3a}$ (c) $\frac{4}{3a}$ (d) $-\frac{3}{4a}$

Q.2 What is the value of $\frac{dy}{dx}$ if $x = 9t^4$ and $y = t$

(a) $\frac{1}{36t^3}$ (b) $\frac{1}{36t^2}$ (c) $\frac{-1}{36t^3}$ (d) $\frac{1}{32t^3}$

Q.3 Find the value of $\frac{dy}{dx}$ if $x = \sin 3t$ and $y = t^2 \tan 2t$ is given.

(a) $\frac{3t\left(\tan 2t + t\sec^2 2t\right)}{4\cos 3t}$ (b) $\frac{\left(\tan 2t + t\sec^2 2t\right)}{3\cos 3t}$

(C) $\frac{-2t\left(\tan 2t + t\sec^2 2t\right)}{3\cos 3t}$ (d) $\frac{2t\left(\tan 2t + t\sec^2 2t\right)}{3\cos^2 t}$

Q.4 If $x = \log t^2$ and $y = \frac{1}{t}$ then find $\frac{dy}{dx}$.

(a) $\frac{1}{2t}$ (b) $-\frac{t}{2}$ (c) $-\frac{1}{2t}$ (d) $\frac{t}{9}$

Q.5 Solve $\frac{dy}{dx}$ when $x = 6\sin^{-1}2t$ and $y = \frac{1}{\sqrt{1-4t^2}}$ is given.

(a) $\frac{t}{1-4t^2}$ (b) $-\frac{1}{3\left(1-4t^2\right)}$ (c) $-\frac{t}{3\left(1-4t^2\right)}$ (d) $\frac{1}{3\left(1-4t^2\right)}$

Q.6 If $x = 2t^2$ and $y = 6t^6$ the find $\frac{dy}{dx}$.

(a) $-9t^4$ (b) $9t^4$ (c) t^4 (d) $9t^3$

Q.7 Determine the value of $\frac{dy}{dx}$ if $x = 2e^t$ and $y = \log t$.

(a) $\frac{1}{2te^t}$ (b) $-\frac{1}{2te^t}$ (c) $\frac{1}{te^t}$ (d) $\frac{1}{e^t}$

Q.8 Find $\frac{dy}{dx}$ if $x = \tan 2\theta$ and $y = \cos 2\theta + \sin^2\theta$ is given.

(a) $-\frac{\tan^2 2\theta \sin 2\theta}{2}$ (b) $\frac{3\tan^2 2\theta \sin 2\theta}{2}$

(c) 0 (d) $\frac{\tan^2 2\theta \sin 2\theta}{2}$

Q.9 Solve $\frac{dy}{dx}$ if $x = \log(\tan t)$ and $y = \log(\sin t)$

(a) $2\cos^2 t$ (b) $\cos^2 2t$ (c) $\cos^2 t$ (d) $-\cos^2 t$

Q.10 Find the value of $\frac{dy}{dx}$ when $x = a^2t^2\cot\theta$ and $y = at\sin\theta$

(a) $\frac{\tan\theta \sin\theta}{at}$ (b) $\frac{\tan\theta \sin\theta}{2at}$ (c) $\frac{\tan\theta \sin\theta}{2t}$ (d) $\frac{\tan\theta \sin\theta}{2a}$

ANSWER KEY

1. (b)

2. (a)

3. (d)

4. (c)

5. (d)

6. (b)

7. (a)

8. (a)

9. (c)

10. (b)