Tangent and Normal MCQs

MCQs on Tangent and Normal - Application of Derivatives

1. **The slope of the tangent to the curve $y = x^3 + 2x + 1$ at $x = 1$ is:**
   - a) 5
   - b) 4
   - c) 3
   - d) 2
2. **The equation of the tangent to the curve $y = x^2 - 3x + 2$ at the point where $x = 2$ is:**
   - a) $y = 2x + 1$
   - b) $y = 4x - 4$
   - c) $y = 5x + 2$
   - d) $y = 4x - 6$
3. **If the tangent to the curve $y = f(x)$ at $x = 3$ is parallel to the x-axis, then:**
   - a) $f'(3) = 1$
   - b) $f'(3) = 0$
   - c) $f(3) = 0$
   - d) $f'(3) = -1$
4. **The normal to the curve $y = x^2 + 3x + 2$ at the point $(1, 6)$ is:**
   - a) $y = -2x + 8$
   - b) $y = -3x + 9$
   - c) $y = 2x - 2$
   - d) $y = 3x + 1$
5. **The equation of the tangent to the curve $y = \sin x$ at $x = \frac{\pi}{3}$ is:**
   - a) $y = \frac{1}{2}x + \frac{\sqrt{3}}{2}$
   - b) $y = \frac{1}{2}x - \frac{\sqrt{3}}{2}$
   - c) $y = \sqrt{3}x - \frac{\sqrt{3}}{2}$
   - d) $y = \frac{1}{2}x + \frac{1}{2}$
6. **For the curve $y = e^x$, the slope of the normal at $x = 0$ is:**
   - a) 1
   - b) -1
   - c) 0
   - d) e
7. **The equation of the normal to the curve $y = \ln x$ at $x = 1$ is:**
   - a) $y = x - 1$
   - b) $y = 1 - x$
   - c) $y = -x + 1$
   - d) $y = 2x + 1$

8. **The curve $y = x^3 - 3x^2 + x$ has a tangent parallel to the x-axis at:**
   - a) $x = 1$
   - b) $x = 0$
   - c) $x = 2$
   - d) $x = -1$
9. **The tangent to the curve $y = \cos x$ at $x = \frac{\pi}{2}$ is:**
   - a) $y = -\sin x$
   - b) $y = \cos x$
   - c) $y = 0$
   - d) $y = 1$
10. **If $y = x^2 + 2x + 3$, then the tangent to the curve at $x = -1$ intersects the x-axis at:**
    - a) $x = 0$
    - b) $x = -2$
    - c) $x = -1$
    - d) $x = 1$
11. **The slope of the normal to the curve $y = x^3 - x + 2$ at $x = 1$ is:**
    - a) -3
    - b) 3
    - c) -1
    - d) $\frac{1}{3}$
12. **The equation of the tangent to the curve $y = \ln(2x + 1)$ at $x = 0$ is:**
    - a) $y = x + 1$
    - b) $y = 2x + 1$
    - c) $y = \frac{1}{2}x$
    - d) $y = \ln(1)$
13. **The curve $y = \frac{1}{x}$ has a normal at $x = 1$ given by:**
    - a) $y = x + 1$
    - b) $y = -x + 2$
    - c) $y = x - 1$
    - d) $y = -x - 1$
14. **The tangent to the curve $y = x^4 - 4x^3 + 2x^2 - x + 1$ at $x = 2$ is:**
    - a) $y = 0$
    - b) $y = 4x - 7$
    - c) $y = 8x - 15$
    - d) $y = 2x + 3$
15. **The point where the tangent to the curve $y = x^2 + 4x + 3$ is horizontal is:**
    - a) $x = -2$
    - b) $x = 0$
    - c) $x = 1$
    - d) $x = 2$
16. **The equation of the normal to the curve $y = x^2 + 1$ at $x = 1$ is:**
    - a) $y = -\frac{1}{2}x + \frac{3}{2}$
    - b) $y = \frac{1}{2}x + \frac{3}{2}$
    - c) $y = -2x + 3$
    - d) $y = 2x + 3$
17. **The equation of the tangent to the curve $y = \tan x$ at $x = \frac{\pi}{4}$ is:**

- a) $y = x + 1$
- b) $y = x - 1$
- c) $y = x$
- d) $y = x + \frac{\pi}{4}$

18. **The normal to the curve $y = \sqrt{x}$ at $x = 4$ has a slope of:**
    - a) $\frac{1}{4}$
    - b) $-\frac{1}{4}$
    - c) $-\frac{1}{2}$
    - d) $\frac{1}{2}$
19. **The slope of the tangent to the curve $y = \frac{1}{x^2}$ at $x = 2$ is:**
    - a) $\frac{1}{4}$
    - b) $-\frac{1}{2}$
    - c) $-\frac{1}{8}$
    - d) $\frac{1}{8}$
20. **The equation of the tangent to the curve $y = \sqrt{4x - 3}$ at $x = 1$ is:**
    - a) $y = x + 1$
    - b) $y = \frac{1}{\sqrt{4x-3}}$
    - c) $y = 2x - 1$
    - d) $y = 3x - 4$
