

Corrective Assignment

| Find the following. | | |
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| 1. $f(x) = \frac{1}{4}x^4 - 4x^2 + 5$ $f''(x) =$ | 2. $y = \frac{3}{2}x^2 - \frac{1}{x^8} + 4x$ $\frac{dy}{dx} =$ | 3. $g(x) = 3x^{-2} - \frac{1}{2}x + 8$ $g'(-2) =$ |
| 4. $r = 3\sqrt{t} - 7t$ $\frac{dr}{dt} =$ | 5. $h(t) = \frac{2t^3 - 4t + 5}{3}$ $h'(-4) =$ | 6. $g(x) = \frac{5x^2 - 4}{2x}$ $g'(x) =$ |
| 7. $f(x) = 4 - \frac{1}{2x^2}$ $f'(3) =$ | 8. $h(r) = \frac{1}{r^3} - \frac{4}{3}r + 5r^3$ $h'''(r) =$ | 9. $y = 3\sqrt{x} - \sqrt[3]{x^2} - 1$ $y' =$ |
| 10. $g(x) = \frac{3}{4}x^{-1} - \frac{1}{2}\sqrt{x}$ $g'(4) =$ | 11. $y = \frac{5}{3}x^{-2} - \frac{1}{\sqrt{x}}$ $\frac{d^2y}{dx^2} =$ | 12. $f(x) = \frac{2x^3 - 4x^2 + 5x}{4}$ $f'(x) =$ |
| 13. $f(x) = \frac{x^2 - 9}{3x}$ $f''(-2) =$ | 14. $y = 3x^{50} - 2x^{16} - 7x$ $y' =$ | 15. $g(d) = 6d^{-\frac{2}{3}} - 7d^{\frac{4}{5}}$ $g'(d) =$ |

Write the equation of the tangent line and the normal line at the point given.

16. $f(x) = -2\sqrt{x} + 4x$ at $x = 9$

17. $y = \frac{2x^2+x-6}{2}$ at $x = -2$

18. $g(x) = 5 - \frac{4}{x}$ at $x = 4$

19. $y = \frac{1}{2}x^2 + \frac{3}{4}x - 4$ at $x = -3$

ANSWERS TO CORRECTIVE ASSIGNMENT 3.1

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| 1. $3x^2 - 8$ | 2. $3x + 8x^{-9} + 4$ or $3x + \frac{8}{x^9} + 4$ | 3. $\frac{1}{4}$ | 4. $\frac{3}{2}t^{-\frac{1}{2}} - 7$ or $\frac{3}{2\sqrt{t}} - 7$ | 5. $\frac{92}{3}$ |
| 6. $\frac{5}{2} + 2x^{-2}$ or $\frac{5}{2} + \frac{2}{x^2}$ | 7. $\frac{1}{27}$ | 8. $-60r^{-6} + 30$ or $-\frac{60}{r^6} + 30$ | 9. $\frac{3}{2}x^{-\frac{1}{2}} - \frac{2}{3}x^{-\frac{1}{3}}$ or $\frac{3}{2\sqrt{x}} - \frac{2}{3\sqrt[3]{x}}$ | 10. $-\frac{11}{64}$ |
| 11. $10x^{-4} + \frac{3}{4}x^{-\frac{5}{2}}$ or $\frac{10}{x^4} + \frac{3}{4\sqrt{x^5}}$ | 12. $\frac{3}{2}x^2 - 2x + \frac{5}{4}$ | 13. $\frac{3}{4}$ | 14. $150x^{49} - 32x^{15} - 7$ | 15. $-4d^{-\frac{5}{3}} - \frac{28}{5}d^{-\frac{1}{5}}$ or $-\frac{4}{\sqrt[3]{d^5}} - \frac{28}{5\sqrt[5]{d}}$ |
| 16. Tangent: $(y - 30) = \frac{11}{3}(x - 9)$ or $y = \frac{11}{3}x - 3$ Normal: $(y - 30) = -\frac{3}{11}(x - 9)$ or $y = -\frac{3}{11}x - \frac{357}{11}$ | 17. Tangent: $y = -\frac{7}{2}(x + 2)$ or $y = -\frac{7}{2}x - 7$ Normal: $y = \frac{2}{7}(x + 2)$ or $y = \frac{2}{7}x + \frac{4}{3}$ | | | |
| 18. Tangent: $(y - 4) = \frac{1}{4}(x - 4)$ or $y = \frac{1}{4}x + 3$ Normal: $(y - 4) = -4(x - 4)$ or $y = -4x + 20$ | 19. Tangent: $(y + \frac{7}{4}) = -\frac{9}{4}(x + 3)$ or $y = -\frac{9}{4}x - 4$ Normal: $(y + \frac{7}{4}) = \frac{4}{9}(x + 3)$ or $y = \frac{4}{9}x + \frac{49}{12}$ | | | |