Derivative Review
Answer Section

SHORT ANSWER

1. ANS:
$f'(t) = -\frac{25}{t^6} + \frac{6}{t^4} - \frac{1}{t^2}$

PTS: 1

2. ANS:
$-3x^2 + 14x$

PTS: 1

3. ANS:
$0.021x^2 - 0.08x + 0.1$

PTS: 1

4. ANS:
$\frac{21}{2} \cdot x^{\frac{1}{2}} - x^{\frac{1}{3}} + 2x - 3$

PTS: 1

5. ANS:
$6 - \frac{11}{2\sqrt{x}}$ or $6 - 11/2\, x^{-1/2}$

PTS: 1

6. ANS:
$-\frac{8}{x^3} + \frac{1}{x^{\frac{7}{6}}}$

PTS: 1

7. ANS:
$f'(t) = \frac{10t^2 + 32t \cdot \sqrt{t} - 3}{2\sqrt{t}}$ or $\frac{2t^3 - 3}{2\sqrt{t}} + 4t(4 + \sqrt{t})$

PTS: 1

8. ANS:
$f'(x) = \frac{x^4 + 15x^2 + 16x}{\left(x^2 + 5\right)^2}$ or $\frac{3x^2(x^2+5) - (x^3 - 8)(2x)}{(x^2+5)^2}$

PTS: 1

9. ANS:

$y = -\frac{3}{2} \cdot x + 6$

PTS: 1

10. ANS:

$y = 9x - 3$

PTS: 1

11. ANS:

$h'(5) = 50$

PTS: 1

12. ANS:

$h'(5) = 26$

PTS: 1

13. ANS:

$f'(x) = 8x^3 - 10x - 6 - \frac{15}{x^2}$ or $4x(x^2 - 3x^{-1}) + (2x^2 - 5)(2x + 3x^{-2})$

PTS: 1

14. ANS:

$f'(x) = \frac{38}{(5x + 3)^2}$

PTS: 1

15. ANS:

$y = -\frac{5}{2} \cdot x + \frac{13}{2}$

PTS: 1

16. ANS:

$f'(x) = 28(4x - 3)^6$

PTS: 1

17. ANS:

$f'(x) = 5x \cdot \left(x^2 - 2\right)^{\frac{3}{2}}$

PTS: 1

18. ANS:

$f'(x) = \frac{2x - 3}{\sqrt{2x^2 - 6x + 7}}$

PTS: 1

19. ANS:

$$f'(t) = -\frac{1}{(2t - 1)^{\frac{3}{2}}}$$

PTS: 1

20. ANS:

$$f'(x) = -8(3x + 1) \cdot \left(3x^2 + 2x + 4\right)^{-5}$$ or $-4(3x^2+2x+4)^{-5}(6x+2)$

PTS: 1

21. ANS:

$$f'(u) = -4\left(u^{-5} + 4u^{-2}\right)^3 \cdot \left(5u^{-6} + 8u^{-3}\right)$$ or $4(u^{-5}+4u^{-2})^3(-5u^{-6}-8u^{-3})$

PTS: 1

22. ANS:

$$f'(x) = (-24x) \cdot (9 - 4x)^3 \cdot (4x - 3)$$ or $8x(9-4x)^4 - 64x^2(9-4x)^3$

PTS: 1

23. ANS:

$$g'(t) = -\frac{4(4t - 1) \cdot (10t - 7)}{(5t + 1)^5}$$ or $\frac{8(4t-1)(5t+1)^4 - 20(4t-1)^2(5t+1)^3}{(5t+1)^8}$

PTS: 1

24. ANS:

$$g'(t) = -\frac{t^2 + 2t - 5}{2\sqrt{t + 1} \cdot \left(t^2 + 5\right)^{\frac{3}{2}}}$$ or $\frac{1/2(t+1)^{-1/2}(t^2+5)^{1/2} - t(t+1)^{1/2}(t^2+5)^{-1/2}}{t^2+5}$

PTS: 1

25. ANS:

$$f'(x) = 9e^{9x}$$

PTS: 1

26. ANS:

$$f'(x) = x^4 \cdot e^x \cdot (x + 5)$$ or $5x^4e^x + x^5e^x$

PTS: 1

27. ANS:

$$f'(x) = \frac{9e^x \cdot (x - 1)}{x^2}$$ or $\frac{9xe^x - 9e^x}{x^2}$

PTS: 1

28. ANS:
$f'(x) = 9 \cdot \left(e^{x} - e^{-x}\right)$ or $9e^{x} - 9e^{-x}$

PTS: 1

29. ANS:
$f'(x) = 21e^{7x-6}$

PTS: 1

30. ANS:
$f'(x) = \dfrac{8e^{-\frac{1}{x}}}{x^{2}}$

PTS: 1

31. ANS:
$f'(x) = 34e^{x} \cdot \left(e^{x} + 1\right)^{33}$

PTS: 1

32. ANS:
$f'(x) = 12\left(3 - e^{-4x}\right)^{2} \cdot e^{-4x}$ or $12e^{-4x}\left(3 - e^{-4x}\right)^{2}$

PTS: 1

33. ANS:
$f'(x) = e^{4x+2}(4x - 3)$ or $e^{4x+2} + 4(x-1)e^{4x+2}$

PTS: 1

34. ANS:
$f''(x) = 16e^{-4x} + 54 \cdot e^{3x}$

PTS: 1

35. ANS:
$f''(x) = e^{5x} \cdot (5x + 2) \cdot 10$ or $20e^{5x} + 50xe^{5x}$

PTS: 1

36. ANS:
$f'(x) = \dfrac{4}{x}$

PTS: 1

37. ANS:
$g'(x) = \dfrac{3}{3x + 2}$

PTS: 1

38. ANS:

$h'(t) = \frac{20}{t}$

PTS: 1

39. ANS:

$f'(x) = \frac{5}{2\sqrt{x} \cdot \left(\sqrt{x} + 6\right)}$

PTS: 1

40. ANS:

$f'(x) = \frac{10x - 4}{5x^2 - 4x + 1}$

PTS: 1

41. ANS:

$f'(x) = \frac{6}{x \cdot (x + 6)}$

PTS: 1

42. ANS:

$f'(x) = 8x \cdot \left(2\ln(2x) + 1\right)$ or $16x \ln 2x + 8x$

PTS: 1

43. ANS:

$f'(x) = \frac{56x^6}{x^7 - 7}$

PTS: 1

44. ANS:

$f'(x) = \frac{9\left(\ln(x)\right)^8}{x}$

PTS: 1

45. ANS:

$f'(x) = 3e^x \cdot \left(\ln\left(\sqrt{x + 3}\right) + \frac{1}{2(x+3)}\right)$ or $3e^x \ln\sqrt{x+3} + \frac{3e^x}{2(x+3)}$

PTS: 1