

Derivative Test Review

2.1-2.3

P1/2

1. $m = 4$

2. $m = -6$

3. $m = -4a = -4x$

4. $\frac{-1}{(a+1)^2}$

5. $\frac{-1}{a\sqrt{a}}$

6. $m = 12$; $y = 12x + 16$

7. $m = 1/4$; $y = 1/4x - 1/2$

8. $g' = 2$

9. $g' = -3/4$

10. Limit DNE - not differentiable at $x = 2$

2.2

11. $y' = 8x^7$

12. $f'(x) = \frac{1}{7x^{6/7}}$

13. $10x^4 - 3x^2 + 5$

14. $2x - 1/4 \cos x$

15. $\frac{9}{8x^4} - 3 \sin x$

16. $f'(x) = 3x^2 + \frac{10}{x^3}$

17. $f'(x) = 4 - \frac{4}{x^3}$

18. $y' = 18x^2 + 3$

19. $y = -\frac{1}{2}$

20. $y = 5x - 4$

21. $x = 0, \pm 2$

$(0, 3)$ $(-2, -29)$ $(2, -29)$

22. $x = 0$, $(0, 1)$

23. a) $s(t) = -16t^2 + 86t$

$v(t) = -32t$

b) $v_a = -48 \text{ ft/sec}$

c) $-32 \text{ ft/sec} = v(1)$
 $-64 \text{ ft/sec} = v(2)$

d) 7.34 sec

e) -234.88 ft/sec

24. $f' = 5x^4 - 9x^2 + 2$

25. $f' = 2x(2\cos x - x\sin x)$

26. $g' = \frac{x \cos x - 3 \sin x}{x^4}$

27. $g' = \frac{2t^2 + 10t + 6}{(2t+5)^2}$

28. $f' = \frac{-2x^4 - x^2 - 12x - 1}{(2x^2 + 1)^2}$

29. $f' = \frac{-x^2 + 6x + 6}{(x^2 + 2x)^2}$

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P2/2

$$30. f' = -1 + 2\sec^2 x$$

$$31. 2\cos x + x^2 \cos x$$

$$32. \frac{1}{3t^{2/3}} + 5\sec t \tan t$$

$$33. f' = \frac{x^2 + 1}{3x^2}$$

$$f'' = \frac{-2}{3x^2}$$

$$34. f' = 3\sin x$$

$$f'' = -3\cos x$$

$$35. f' = \frac{-2}{x^2 - 2x + 1}$$

$$f'' = \frac{4}{(x-3)^2}$$

$$36. f'(1) = -24$$

$$37. f'(2) = 4$$

$$38. f'\left(\frac{\pi}{2}\right) = -\frac{\pi}{2}$$