

Name _____

MA1 Calculus
Review

17 Oct 2006

1-16 □ Differentiate the function.

1. $f(x) = 5x - 1$

2. $F(x) = -4x^{10}$

3. $f(x) = x^2 + 3x - 4$

4. $g(x) = 5x^8 - 2x^5 + 6$

5. $V(r) = \frac{4}{3}\pi r^3$

6. $s(t) = t^3 - 3t^2 + 12t$

7. $F(x) = (16x)^3$

8. $H(s) = (s/2)^5$

9. $Y(t) = 6t^{-9}$

10. $R(t) = 5t^{-3/5}$

11. $y = 4\pi^2$

12. $R(x) = \frac{\sqrt{10}}{x^7}$

13. $g(x) = x^2 + \frac{1}{x^2}$

14. $f(t) = \sqrt{t} - \frac{1}{\sqrt{t}}$

15. $y = \sqrt{5x}$

16. $y = x^{4/3} - x^{2/3}$

17. Find the derivative of $y = (x^2 + 1)(x^3 + 1)$ in two ways: by using the Product Rule and by performing the multiplication first. Do your answers agree?

18. Find the derivative of the function

$$F(x) = \frac{x - 3x\sqrt{x}}{\sqrt{x}}$$

in two ways: by using the Quotient Rule and by simplifying first. Show that your answers are equivalent. Which method do you prefer?

19-40 □ Differentiate.

19. $G(s) = (s^2 + s + 1)(s^2 + 2)$

20. $G(y) = (y^2 + 1)(2y - 7)$

21. $H(x) = (x^3 - x + 1)(x^{-2} + 2x^{-3})$

22. $H(t) = \sqrt[3]{t}(t + 2)$

23. $h(x) = \frac{x + 2}{x - 1}$

24. $f(u) = \frac{1 - u^2}{1 + u^2}$

25. $y = \frac{x^2 + 4x + 3}{\sqrt{x}}$

26. $y = \frac{\sqrt{x} - 1}{\sqrt{x} + 1}$

27. $y = \frac{1}{x^4 + x^2 + 1}$

28. $y = x^2 + x + x^{-1} + x^{-2}$

29. $y = ax^2 + bx + c$

30. $y = A + \frac{B}{x} + \frac{C}{x^2}$

31. $y = \frac{3t - 7}{t^2 + 5t - 4}$

32. $y = \frac{4t + 5}{2 - 3t}$

33. $y = x + \sqrt[3]{x^2}$

34. $u = \sqrt[3]{t^2} + 2\sqrt{t^3}$

35. $v = x\sqrt{x} + \frac{1}{x^2\sqrt{x}}$

36. $v = \frac{6}{\sqrt[3]{t^5}}$