Find the derivative of each of the following:

1. $y = x^5$
2. $y = x^{\pi}$
3. $y = 3^{\pi}$
4. $y = \pi^5$
5. $y = 4x^7$
6. $y = -8x^4$
7. $y = \frac{x^3}{2}$
8. $y = \frac{x^7}{14}$
9. $y = \frac{3x^5}{2}$
10. $y = \frac{-2x^{11}}{5}$
11. $y = x^{-3}$
12. $y = 5x^{-5}$
13. $y = \frac{1}{x}$
14. $y = \frac{1}{x^4}$
15. $y = \frac{3}{x^7}$
16. $y = \frac{1}{5x}$
17. $y = \frac{1}{4x^3}$
18. $y = \frac{3}{2x^5}$
19. $y = \frac{4}{7x^4}$
20. $y = 3x^{\frac{2}{3}}$
21. $y = -2x^{\frac{7}{4}}$
22. $y = \sqrt{x}$
23. $y = \sqrt[3]{x}^2$
24. $y = \frac{1}{\sqrt{x}}$
25. $y = \frac{1}{\sqrt[3]{x}}$
26. $y = \frac{4}{\sqrt[4]{x}^3}$
27. $y = -\frac{5}{\sqrt[7]{x}^3}$
28. $y = \frac{3}{4\sqrt{x}}$
29. $y = \frac{-2}{5\sqrt[3]{x}^5}$
30. $y = (2x)^3$
31. $y = (3x)^4$
32. $y = (2x)^{-4}$
33. $y = \frac{1}{(3x)^2}$
34. $y = \frac{5}{(2x)^4}$
35. $y = \sqrt{3x}$
36. $y = \sqrt[5]{2x}$
37. $y = \frac{1}{\sqrt{5x}}$
38. $y = \frac{3}{4\sqrt[5]{3x}^2}$
39. $y = \frac{x^2}{\sqrt{x}}$
40. $y = \frac{\sqrt[3]{x}}{x^3}$
41. $y = \frac{\sqrt[3]{x}}{\sqrt{x}}$
42. $y = \frac{(2x)^3}{(5x)^2}$

Answers:

1. $y' = 5x^4$
2. $y' = \pi x^{\pi - 1}$
3. $y' = 0$
4. $y' = 0$
5. $y' = 28x^6$
6. $y' = -32x^3$
7. $y' = \frac{3x^2}{2}$
8. $y' = \frac{x^6}{2}$
9. $y' = \frac{15x^4}{2}$
10. $y' = \frac{-22x^{10}}{5}$
11. $y' = -3x^{-4}$
12. $y' = -25x^{-6}$
13. $y' = -1x^{-2} = -\frac{1}{x^2}$
14. $y' = -4x^{-5} = -\frac{4}{x^5}$
15. $y' = -21x^{-8} = -\frac{21}{x^8}$
16. $y' = -\frac{1}{5}x^{-2} = -\frac{1}{5x^2}$
17. $y' = -\frac{3}{4}x^{-4} = -\frac{3}{4x^4}$
18. $y' = -\frac{15}{2}x^{-6} = -\frac{15}{2x^6}$
19. $y' = -\frac{16}{7}x^{-5} = -\frac{16}{7x^5}$
20. $y' = 2x^{-\frac{1}{3}}$
21. $y' = -\frac{7}{2}x^{\frac{3}{4}}$
22. $y' = \frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$
23. $y' = \frac{2}{3}x^{-\frac{1}{3}} = \frac{2}{3\sqrt[3]{x^2}}$
24. $y' = -\frac{1}{2}x^{-\frac{3}{2}} = -\frac{1}{2\sqrt{x^3}}$
25. $y' = -\frac{1}{3}x^{-\frac{4}{3}} = -\frac{1}{3\sqrt[3]{x^4}}$
26. $y' = -3x^{-\frac{7}{4}} = -\frac{3}{\sqrt[4]{x^7}}$
27. $y' = \frac{15}{7}x^{-\frac{10}{7}} = \frac{15}{7\sqrt[7]{x^{10}}}$
28. $y' = -\frac{3}{8}x^{-\frac{3}{2}} = -\frac{3}{8\sqrt{x^3}}$
29. $y' = \frac{2}{3}x^{-\frac{8}{3}} = \frac{2}{3\sqrt[3]{x^8}}$
30. $y' = 24x^2$
31. $y' = 324x^3$
32. $y' = -\frac{1}{4}x^{-5} = -\frac{1}{4x^5}$
33. $y' = -\frac{2}{9}x^{-3} = -\frac{2}{9x^3}$
34. $y' = -\frac{5}{4}x^{-5} = -\frac{5}{4x^5}$
35. $y' = \frac{\sqrt{3}}{2}x^{-\frac{1}{2}} = \frac{\sqrt{3}}{2\sqrt{x}}$
36. $y' = \frac{\sqrt[5]{2}}{5}x^{-\frac{4}{5}} = \frac{\sqrt[5]{2}}{5\sqrt[5]{x^4}}$

37. $y' = -\frac{1}{2\sqrt{5}}x^{-\frac{3}{2}} = -\frac{1}{2\left(\sqrt{5x^3}\right)}$

38. $y' = -\frac{3}{10\sqrt[5]{9}}x^{-\frac{7}{9}} = -\frac{3}{10\sqrt[5]{9x^7}}$

39. $y' = \frac{3}{2}x^{\frac{1}{2}} = \frac{3\sqrt{x}}{2}$

40. $y' = -\frac{8}{3}x^{-\frac{11}{3}} = -\frac{8}{3\sqrt[3]{x^{11}}}$

41. $y' = -\frac{1}{6}x^{-\frac{7}{6}} = -\frac{1}{6\sqrt[6]{x^7}}$

42. $y' = \frac{8}{25}$