

No calculators will be allowed and no partial credit will be given.

1. Differentiate the function $f(x) = -x^4 + 13x - 5$. Express your answer in terms of elementary functions.
2. Let $y = -e^t + t^3 + 3t^{\frac{3}{2}}$. Find $\frac{dy}{dt}$. Express your answer in terms of elementary functions.
3. Let $y = \cos(t) + 2t^8$. Find $\frac{dy}{dt}$. Express your answer in terms of elementary functions.
4. Differentiate the function $g(x) = 2 \cos(x) + e^x - 5x^2$. Express your answer in terms of elementary functions.
5. Differentiate the function $f(x) = \ln(4)x + e^3$. Express your answer in terms of elementary functions.
6. Differentiate the function $f(x) = (4x^3 + 5x + 3)(5x^4 + 3x + 2)$. Express your answer in terms of elementary functions.
7. Let $y = \left(1 - 2t^{\frac{5}{2}}\right)e^t$. Find $\frac{dy}{dt}$. Express your answer in terms of elementary functions.
8. Differentiate the function $f(x) = 3e^x \sec(x)$. Express your answer in terms of elementary functions.
9. Differentiate the function $f(t) = 6t^4 \ln(t)$. Express your answer in terms of elementary functions.
10. Differentiate the function $h(x) = \frac{e^x}{e^x + 8x^4 + 1}$. Express your answer in terms of elementary functions.
11. Differentiate the function $f(t) = \frac{3e^t}{\cos(t)}$. Express your answer in terms of elementary functions.
12. Differentiate the function $f(t) = \frac{6 \cos(t)}{t^3}$. Express your answer in terms of elementary functions.
13. Let $y = \frac{2t^3}{\sec(t)}$. Find $\frac{dy}{dt}$. Express your answer in terms of elementary functions.

1. $13 - 4x^3$
2. $-e^t + 3t^2 + \frac{9\sqrt{t}}{2}$
3. $16t^7 - \sin(t)$
4. $-2\sin(x) + e^x - 10x$
5. $\ln(4)$
6. $(12x^2 + 5)(5x^4 + 3x + 2) + (4x^3 + 5x + 3)(20x^3 + 3)$
7. $(1 - 2t^{\frac{5}{2}})e^t - 5t^{\frac{3}{2}}e^t$
8. $3e^x \sec(x) \tan(x) + 3e^x \sec(x)$
9. $24t^3 \ln(t) + 6t^3$
10. $\frac{e^x}{e^x + 8x^4 + 1} - \frac{e^x(e^x + 32x^3)}{(e^x + 8x^4 + 1)^2}$
11. $\frac{3e^t \sin(t)}{(\cos(t))^2} + \frac{3e^t}{\cos(t)}$
12. $-\frac{6 \sin(t)}{t^3} - \frac{18 \cos(t)}{t^4}$
13. $\frac{6t^2}{\sec(t)} - \frac{2t^3 \tan(t)}{\sec(t)}$