

- Chapter Review Chapter 2: 3,5,23,25,36
- Chapter Review Chapter 3: 3,5,7,22,25,34,60,61,62,63,77,80,81,82
- Check your understanding Chapter 2: 10,11,12,15,17,22,23
- Check your understanding Chapter 3: 1,2,6,7,11
- Consider the following table:

x	2	4	8	12	16
$f(x)$	2	4	10	2	0
$f'(x)$	1	3	-1	3	2
$g(x)$	9	4	20	-1	-3
$g'(x)$	3	6	9	-6	-10

Find the derivative at 4 of: a) $f(3x)$, b) $f(x) + 9g(x)$, c) $f(f(x))$, d) $[f(x)]^2$, e) $f(x)g(x)$, f) $\frac{f(x)}{g(x)}$, g) $f(g(x))$, h) $g(f(x))$, i) $g(f(f(x)))$, j) $\sin g(x)$, k) $f(x)^3 - f(x^2)$, l) $f(3x)\sqrt{x}$

6. Compute the first and second derivatives of the following: a) $x^2 \sin x$, b) $(x+1)^4 \sqrt{x}$.

7. State the definitions of derivative of f at 4 and of the statement “ f is continuous at 4.”

8. Differentiate the following:

a) $(3x+2)x^{300}$, b) $\frac{x^3+1}{x+2}$, c) $\sqrt[3]{x^2-2x}$, d) $\frac{e^x}{2x^2-1}$, e) $\cos(-x)$, f) $(2x+3)^{1999}$, g) $\frac{1}{100}(x+3x^3)^{99}$, h) e^{5x+1} , i) $\sin^2 x$, j) 2^{x^2+1} , k) $x^2 e^x \sin x$, l) $\cos \sqrt{x}$, m) $\frac{x}{\sin x}$, n) $e^2 + 4\pi$, o) $4^2 - \frac{x}{e^{x^2}}$, o) x^e , p) $10^{\sin(x^3+2)}$

9. a) Give a quadratic polynomial $p(x)$ which satisfies $p(0) = 2$, $p'(0) = 3$, $p''(0) = 7$.

b) Give an exponential function $E(x)$ which satisfies $E(0) = 2$, $E'(0) = 2 \ln 4$.

10. Give the equation of a tangent line to the following curves at $x = 1$.

a) $4x^2$ b) $\tan x$ c) 2^{-3x}

11. List two ways a function can be continuous but not differentiable at the same point.