

MCS 119

Derivative Review

1. Compute the derivative of each of the following functions.

(a) $y = x^{4/3}$

(b) $f(x) = \frac{1}{x^4}$

(c) $y = 3t^5 - 5\sqrt{t} + \frac{7}{t}$

(d) $f(x) = \sqrt{\frac{1}{x^3}}$

(e) $y = \frac{t+1}{t^2}$

(f) $y = (t^2 + 3)(2 + 3t + 4t^2)$

$$(g) f(x) = \frac{1+x}{2+3x+4x^2}$$

$$(h) h(p) = \frac{1+p^2}{3+2p^2}$$

$$(i) f(x) = (2x+1)^{100}$$

$$(j) y = \left(\frac{x^2+2}{3}\right)^2$$

$$(k) h(x) = \sqrt{\frac{x^2+9}{x+3}}$$

$$(l) y = \frac{(x^2+1)(x-1)}{2x^3-x}$$

2. Use the table and the formulas below to find the following derivatives.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
0	1	1	2	10
1	2	0	3	2
2	3	-3	1	-1
3	0	-2	4	3
4	4	-1	1	2

(a) If $P(x) = f(x)g(x)$ find $P'(1)$ and $P'(4)$.

(b) If $Q(x) = f(x)/g(x)$ find $Q'(2)$ and $Q'(3)$.

(c) If $R(x) = 1/f(x)$ find $R'(3)$.

(d) If $C(x) = f(g(x))$ find $C'(0)$ and $C'(4)$.

(e) If $D(x) = g(f(x))$ find $D'(0)$ and $D'(4)$.