

Math 191-DX01
Test 3

SUBMISSION DEADLINE: 2:30pm Pacific Time

Submit on D2L or email HowardL@camosun.ca

Number of Questions: 4
Total Marks: 19

Show all your work for full marks.

You MAY use the course website (notes, videos etc)

You may NOT copy from others (classmates, tutors, Chegg etc)

Submit jpg or pdf files

Feel free to handwrite your solutions and take photos of your work

1. [4 marks] Cut the corners from a 30cm x 30cm metal sheet to form an open-topped box. Find the height of the box that maximizes the box's volume.

2. [3 marks] Let $V = \frac{2\pi}{3}r^3$

a) Find dV

b) Simplify $\frac{dV}{V}$

c) If the relative error in r is 7%, find the relative error in V .

3. [6 marks] Find $\frac{dy}{dx}$:

a) $y = 7 \sin^2(1 + x^4)$

b) $y = 3 \sec(1 + 4x)$

c) $y = \tan^{-1} x^2$

4. [6 marks] Find $f'(x)$:

a) $f(x) = \log_7(8x^2 + 3)$

b) $f(x) = \ln\left(\frac{1}{x^2}\right)$

c) $f(x) = 4^{2-3x}$