

Math 191-DX01
Test 2

SUBMISSION DEADLINE: 2:30pm Pacific Time

Submit on D2L or email HowardL@camosun.ca

Number of Questions: 5
Total Marks: 20

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

a) $f(x) = \frac{2}{\sqrt[3]{x}}$

b) $f(x) = (x^2 + 9)^6$

c) $f(x) = \sqrt{4 - 2x}$

2. [5 marks] Find $\frac{dy}{dx}$ given:

$$xy^3 + x^3 - y^2 + 7 = 0$$

3. [5 marks] An object's position in metres after t seconds is given by $x = t - t^3$ and $y = 3t^2 + 1$.

Find the magnitude and direction of the object's acceleration at $t = 5$ seconds. Round your values to one decimal place.

4. [3 marks] The vapour in a diesel engine has pressure p (in kPa) and volume V (in cm^3) given by $p = V^{-1.4}$

The volume is increasing at $120 \text{ cm}^3/\text{s}$. How fast is the pressure changing when the volume is 20 cm^3 ? Round your answer to two decimal places.

5. [4 marks] Find all relative maximum and relative minimum points for the function below. For each point: find the y -coordinate AND state whether the point is a maximum or minimum.

$$f(x) = 6x^5 - x^6$$