

Q 6

(a) $f(x) = 1 + 3x^2 - 2x^3$

$f'(x) = 0$ at maximum / minimum value

$\frac{d}{dx} f'(x) = \frac{d}{dx} (1 + 3x^2 - 2x^3) = 0$

$$6x - 6x^2 = 0$$

~~$6x - 6x$~~

$$6x(1-x) = 0, \quad x = 0, x = 1.$$

By first derivative test;

$f'(x) > 0$ at ^{interval} ~~point~~ $0 < x < 1$ and

$f'(x) < 0$ at $0 > x > 1$

f is increasing ~~on the~~ at point $(0, 1)$ hence
 f has maximum value at $x = 1$

f is decreasing at point $(-\infty, 0)$ and ~~increases~~
increasing when $1 > 0$ hence f has a
minimum value at $x = 0$.