

No notes or calculators. Show all work.

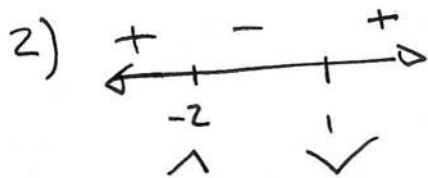
Consider the following function:

$$f(x) = 2x^3 + 3x^2 - 12x + 1$$

1. (3 points) Find the critical numbers.
2. (5 points) State the intervals of increase and decrease. (minus 1 point if not answers not in interval form).
3. (2 points) Determine if there is a relative max or min at each critical number found in (1).

$$\begin{aligned} 1) \quad f'(x) &= 6x^2 + 6x - 12 = 6(x^2 + x - 2) \\ &= 6(x+2)(x-1) = 0 \end{aligned}$$

$$\rightarrow x = -2, x = 1$$



increase: $(-\infty, -2) \cup (1, \infty)$

decrease: $(-2, 1)$

Test points

$x = -3$	$f'(-3) = (-)(-) = +$
$x = 0$	$f'(0) = (+)(-) = -$
$x = 2$	$f'(2) = (+)(+) = +$

3) rel max @ $x = -2$

rel min @ $x = 1$