

SOLUTION IN-CLASS  
ASSIGNMENT # 9

①

GRAPHING FUNCTIONS

$$Y = 2x^3 + 3x^2 - 12x$$

①  $x$  &  $y$  intercepts

$$Y = x(2x^2 + 3x - 12)$$

$$Y = 0 \quad 0 = x(2x^2 + 3x - 12)$$

$$x_1 = 0 \quad \text{or} \quad 2x^2 + 3x - 12 = 0$$

$$x = \frac{-3 \pm \sqrt{9 - 4(2)(-12)}}{2(2)}$$
$$= \frac{-3 \pm \sqrt{105}}{4}$$

$$x_2 = -3.3 \quad x_3 = 1.8$$

$x$ -intercepts :  $(0,0)$ ,  $(1.8,0)$ ,  $(-3.3,0)$

$y$ -intercept :  $(0,0)$

② BEHAVIOUR OF FUNCTION AT  $\infty$

$$\lim_{x \rightarrow \infty} 2x^3 + 3x^2 - 12x \rightarrow +\infty$$

$$\lim_{x \rightarrow -\infty} 2x^3 + 3x^2 - 12x \rightarrow -\infty$$

3 DOMAIN  $\mathbb{R}$  BECAUSE THE FUNCTION IS A POLYNOMIAL

4  $Y = 2x^3 + 3x^2 - 12x$

$Y' = 6x^2 + 6x - 12$   
 $= 6(x^2 + x - 2)$   
 $= 6(x+2)(x-1)$

CRITICAL POINTS  $x=1$  &  $x=-2$

	$(-\infty, -2)$	$(-2, 1)$	$(1, \infty)$
INTER. TEST SIGN $y'$	-3 + ↗	0 - ↘	2 + ↗

MAX AT  $x=-2$   
MIN AT  $x=1$

C COORDINATES:  
 $(1, -7)$  &  $(-2, 20)$

5  $Y'' = 12x + 6$   
 $= 6(2x + 1)$

$x = -1/2$  CRIT. PT.

INFLECTION PT AT  $x = -1/2$   
 $y = 6.5$

	$(-\infty, -1/2)$	$(-1/2, \infty)$
INT. TEST SIGN $y''$	-1 - ∩	0 + ∪

