

Graphing Examples for Lecture.docx

$$f(x) = -2x^3 - 3x^2 + 12x + 8$$

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

$$0 = -6(x^2 + x - 2)$$

$$0 = (x + 2)(x - 1)$$

$$16 - 12 - 24 + 8$$

$$-2 - 3 + 12 + 8$$

$$\text{MIN: } (-2, -12) \text{ \& \text{MAX: } (1, 15)}$$

$$24 - 6 \Rightarrow + \text{ Smile}$$

$$-12 - 6 \Rightarrow - \text{ Frown}$$

$$f''(x) = -12x - 6$$

$$0 = -6(2x + 1) \rightarrow 0 = 2x + 1$$

$$1/4 - 3/4 - 6 + 8$$

$$\text{IP: } (-\frac{1}{2}, 1\frac{1}{2})$$

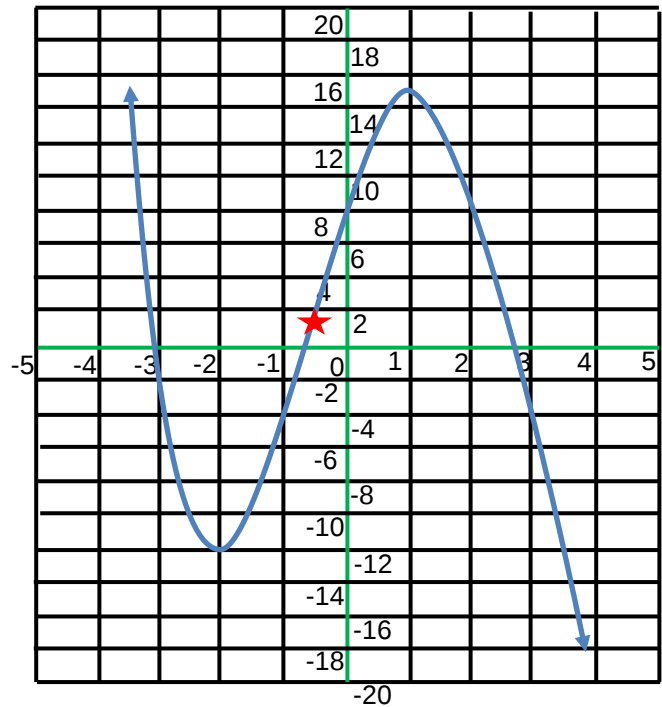
$$\text{Y.I: } (0, 8)$$

$$\text{E.B.: As } x \rightarrow +\infty \quad f(x) \rightarrow -\infty$$

$$\text{As } x \rightarrow -\infty \quad f(x) \rightarrow +\infty$$

$$\downarrow (-\infty, -2) \cup (1, +\infty) \quad \uparrow (-2, 1)$$

$$\text{Smile: } (-\infty, -\frac{1}{2}) \quad \text{Frown: } (-\frac{1}{2}, +\infty)$$



$$y = x^3 - \frac{3}{2}x^2 - 6x$$

$$y' = 3x^2 - 3x - 6$$

$$0 = 3(x^2 - x - 2)$$

$$0 = (x - 2)(x + 1)$$

$$8 - 6 - 12$$

$$-1 - 3/2 + 6$$

$$\text{MIN: } (2, -10) \text{ \& \text{MAX: } } (-1, 3\frac{1}{2})$$

$$12 - 3 \Rightarrow + \text{ Smile}$$

$$-6 - 3 \Rightarrow - \text{ Frown}$$

$$y'' = 6x - 3$$

$$0 = 3(2x - 1) \rightarrow 0 = 2x - 1$$

$$1/8 - 3/8 - 3$$

$$\text{IP: } (\frac{1}{2}, -3\frac{1}{4})$$

$$\text{Y.I: } (0, 0)$$

$$\text{E.B.: As } x \rightarrow +\infty \quad f(x) \rightarrow +\infty$$

$$\text{As } x \rightarrow -\infty \quad f(x) \rightarrow -\infty$$

$$\downarrow (-1, 2) \quad \uparrow (-\infty, -1) \cup (2, +\infty)$$

$$\text{Smile: } (\frac{1}{2}, +\infty) \quad \text{Frown: } (-\infty, \frac{1}{2})$$

