

Homework 7:

$$3) \frac{d}{dx}(-5e^x) = -5e^x$$

$$4) f(x) = -x^3 + 9x^2 - 6x + 9 \quad @ (7, 65)$$

$$f'(x) = -3x^2 + 18x - 6$$

$$f'(7) = -3 \cdot 49 + 18 \cdot 7 - 6 \\ = -27$$

$$y - 65 = -27(x - 7)$$

$$y - 65 = -27x + 189$$

$$y = -27x + 254$$

Homework 8:

$$4) f(x) = \frac{x^{\frac{1}{3}} - 4}{x^{\frac{7}{2}}} = \frac{x^{\frac{1}{3}}}{x^{\frac{7}{2}}} - \frac{4}{x^{\frac{7}{2}}} = x^{\frac{1}{3} - \frac{7}{2}} - 4x^{-\frac{7}{2}}$$

$$= x^{\frac{2}{6} - \frac{21}{6}} - 4x^{-\frac{7}{2}} = x^{-\frac{19}{6}} - 4x^{-\frac{7}{2}}$$

$$f'(x) = -\frac{19}{6}x^{-\frac{25}{6}} + 14x^{-\frac{9}{2}} \quad -4 \cdot -\frac{7}{2}x^{-\frac{9}{2}}$$

$$6) f(x) = \frac{x^2 - 2e^x}{x + 3e^x}$$

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

$$7) f(x) = (3 - 5xe^x)(3x + 2)$$

$$= 9x + 6 - 15x^2e^x - 10xe^x$$

$$f'(x) = 9 - (15x^2e^x + 30xe^x) - (10xe^x + 10e^x)$$

$$= 9 - 15x^2e^x - 30xe^x - 10xe^x - 10e^x$$

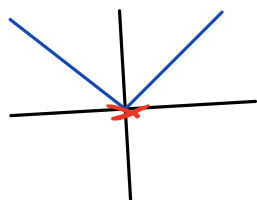
$$= 9 - 15x^2e^x - 40xe^x - 10e^x$$

$$8) f(x) = (x^3 - 2x + 1)(3x^3 + 2x^2 - 5x)$$

$$f'(x) = (x^3 - 2x + 1)(9x^2 + 4x - 5) + (3x^3 + 2x^2 - 5x)(3x^2 - 2)$$

Differentiability

- continuous



- asymptote /
vertical
tangent line
(defined slope)

