

1.) (5 pts. each) Differentiate each function. Do NOT simplify answers.

a.) $y = (3x - 5) \cdot \sqrt{x}$

$$\frac{D}{\rightarrow} y' = (3x - 5) \cdot \frac{1}{2} x^{-1/2} + (3) \cdot \sqrt{x}$$

b.) $y = \frac{x}{7} + \frac{7}{x} = \frac{1}{7}x + \frac{7}{x} = \frac{1}{7}x + 7x^{-1}$

$$\frac{D}{\rightarrow} y' = \frac{1}{7} - 7x^{-2}$$

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

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

2.) (15 pts.) For the given function determine the derivative $f'(x)$. Then solve $f'(x) = 0$ for x and set up a sign chart for f' .

$$f(x) = \frac{x^2}{x-2} \quad \frac{D}{\rightarrow} f'(x) = \frac{(x-2)2x - x^2(1)}{(x-2)^2}$$

$$= \frac{2x^2 - 4x - x^2}{(x-2)^2} = \frac{x^2 - 4x}{(x-2)^2} = \frac{x(x-4)}{(x-2)^2} = 0$$

