

Math 241 Worksheet 5 (two-sided)

Name: _____

Section (circle one): **3** **4**

1. Differentiate the following functions using derivative rules.

(a) $f(x) = 10x^3 + 7 + \frac{1}{\sqrt[3]{x}} + 3\sec(x)$

(b) $y = x^3 \cos(x)$

(c) $r = \frac{\tan \theta}{5\theta + 4}$

2. Find the second derivative: $y = x^2 + 3\sin(x)$.

3. Suppose the position function of an object is given by $s(t) = t^3 - 9t^2 + 15t$.

(a) Find the velocity and acceleration functions.

(b) Find the position, velocity, speed, and acceleration at time $t = 2$.

(c) At what time(s) is the object at rest (velocity zero)?

(d) At what time interval(s) is the object moving backwards (positive velocity)?

(e) At what time interval(s) is the object moving backwards (negative velocity)?