(C1-7.7a)  Name:

## **Homework Questions 7 - Rate of Change**

For the rate of change of the following by differentiating

1.

    *find* $\dfrac{d\theta}{dt}$ *where* $\theta = t^3 - 4t + 6$

$$\boxed{\dfrac{d\theta}{dt} = 3t^2 - 4}$$

2.

    *find* $\dfrac{dx}{dy}$ *where* $x = 7y^2 - 3y + 2$

$$\boxed{\dfrac{dx}{dy} = 14y - 3}$$

3.

    *find* $\dfrac{dr}{dt}$ *where* $r = 3t^2 - 2t + 1$

$$\boxed{\dfrac{dr}{dt} = 6t - 2}$$

4.

    *find* $\dfrac{da}{dr}$ *where* $a = \pi r^2$

$$\boxed{\dfrac{da}{dr} = 2\pi r}$$

5.

    *find* $\dfrac{dt}{dy}$ *where* $t = y^2(y + 3)$

$$\boxed{\dfrac{dt}{dy} = 3y^2 + 6y}$$

6.

find $\dfrac{ds}{dt}$ where $s = 7t^2 - 6t$

$$\boxed{\dfrac{ds}{dt} = 4t - 6}$$

7.

find $\dfrac{da}{dx}$ where $a = 8x^3 - 2x^2 - 3$

$$\boxed{\dfrac{da}{dx} = 24x - 4x}$$

8.

find $\dfrac{dy}{dx}$ where $y = 5x^2 - \dfrac{1}{x^3} + x$

$$\boxed{\dfrac{dy}{dx} = 10x + 3x^{-4}}$$

9.

find $\dfrac{dy}{dx}$ where $y = (x - 4)(2 - 3x)$

$$\boxed{\dfrac{dy}{dx} = -6x + 14}$$

10.

find $\dfrac{d\theta}{dt}$ where $\theta = (t + 1)(t^2 - 4)$

$$\boxed{\dfrac{d\theta}{dt} = 3t^2 + 2t - 4}$$