

2.5/2.6

Answers - Review for Related Rates  
& Implicit Differentiation P1/2

1.  $\frac{dA}{dt} = 2\pi r \frac{dr}{dt}$

2.  $\frac{ds}{dt} = 8\pi r \frac{dr}{dt}$

3.  $\frac{dA}{dt} = \pi \text{ cm}^2/\text{sec}$

4. a)  $\frac{dA}{dt} = 14 \text{ cm}^2/\text{sec}$

b)  $\frac{dP}{dt} = 0 \text{ cm}/\text{sec}$

c)  $\frac{dd}{dt} = \frac{-14 \text{ cm}}{13 \text{ sec}}$

5. a)  $\frac{dr}{dt} = 1 \frac{\text{ft}}{\text{min}}$

b)  $\frac{ds}{dt} = 40\pi \frac{\text{ft}^2}{\text{min}}$

6.  $\frac{dx}{dt} = \frac{1000\sqrt{51}}{17} \text{ mph}$

7.  $\frac{dc}{dt} = 20 \frac{\text{ft}}{\text{sec}}$

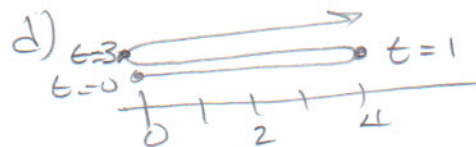
8.  $\frac{dv}{dt} = 4\pi \frac{dr}{dt}$

9.  $\frac{db}{dt} = \frac{-3}{4} \frac{\text{ft}}{\text{sec}}$

10.  $\frac{dh}{dt} = \frac{9}{10\pi} \text{ m/hr.}$

11.  $v = 3t^2 - 12t + 9$

(a)  $a = 6t - 12$

(b) Right:  $(0, 1) \rightarrow (3, 0)$   
Left:  $(1, 3)$ (c)  $t=0 \quad s=0 \text{ m}$   
 $t=1 \quad s=4 \text{ m}$   
 $t=3 \quad s=0 \text{ m.}$ 

$$12. \frac{dy}{dt} = \frac{-x^2}{y^2}$$

$$13. \frac{dy}{dt} = \frac{1 - 3x^2y^3}{3x^3y^2 - 1}$$

$$14. \frac{dy}{dx} = \cot x \cot y$$

$$15. \frac{dy}{dx} = \frac{-y}{x} = \boxed{\frac{1}{4}}$$

$$16. \frac{dy}{dx} = \frac{4y - 3x^2}{3y^2 - 4x} = \boxed{\frac{8}{5}}$$