

## Derivatives Worksheet

1.  $\frac{d}{dx}[x^{-1}]$

2.  $\frac{d}{dx}[x^{1/2}]$

3.  $\frac{d}{dx}[x^4 + x^2]$

4.  $\frac{d}{dx}[6x^{11} - 9]$

5.  $\frac{d}{dx}[3x^8 - 2x^5 + 6x + 1]$

6. Find  $\frac{dy}{dx}$  if  $y = (4x^2 - 1)(7x^3 + x)$

7. Find  $\frac{dy}{dx}$  if  $y = (3x^2 + 6)(2x - \frac{1}{4})$

8. Find  $\frac{dy}{dx}$  if  $y = \frac{(x^2 - 1)}{(x^4 + 1)}$

9. Find  $\frac{dy}{dx}$  if  $y = \frac{3t}{(2t + 1)}$

10. Find the rate of change of the diameter of a circle with respect to radius.

11. Find the rate of change of the surface area  $A$  of a sphere with respect to radius  $r$ . Hint: Recall  $A = 4\pi r^2$ .