## Answers to Worksheet 4 - Derivatives I

1) 
$$\frac{dy}{dx} = 4$$

2) 
$$\frac{dy}{dx} = -2$$

3) 
$$\frac{dy}{dx} = -6x$$

4) 
$$\frac{dy}{dx} = -10x$$

$$5) \ \frac{dy}{dx} = -20x^3$$

2) 
$$\frac{dy}{dx} = -2$$
 3)  $\frac{dy}{dx} = -6x$  4)  $\frac{dy}{dx} = -10x$   
6)  $f'(x) = -4x^{-5}\sqrt{3}$  7)  $f'(x) = 6x^{-3}$  8)  $f'(x) = -\frac{15}{4}bx^{-\frac{1}{4}}$  15b

7) 
$$f'(x) = 6x^{-3}$$
  
=  $\frac{6}{x^3}$ 

8) 
$$f'(x) = -\frac{15}{4}bx^{-\frac{1}{4}}$$
  
=  $-\frac{15b}{4x^{\frac{1}{4}}}$ 

9) 
$$f'(x) = -\frac{5}{3}$$
 10)  $f'(x) = \frac{3}{4}$ 

10) 
$$f'(x) = \frac{3}{4}$$

$$11) \frac{dy}{dx} = -3x^{-4}\sqrt{3}$$
$$= -\frac{3\sqrt{3}}{x^4}$$

12) 
$$f'(x) = \frac{5}{3}x^{\frac{2}{3}}$$

$$= \frac{5x^{\frac{2}{3}}}{3}$$

13) 
$$f'(x) = \frac{3}{5}x^{-\frac{2}{5}}\sqrt{5}$$
 14)  $f'(x) = \frac{4}{3}x^{-2}$ 

$$= \frac{3\sqrt{5}}{5x^{\frac{2}{5}}}$$

$$= \frac{4}{3x^{2}}$$

$$) = \frac{3}{5}x^{-\frac{2}{5}}\sqrt{5}$$
 14)  $f'(x) = \frac{4}{3}x^{-2}$  
$$= \frac{3\sqrt{5}}{\frac{2}{5}x^{\frac{2}{5}}}$$
 
$$= \frac{4}{3x^{2}}$$

$$15) \ f'(x) = 2x\sqrt{3}$$

16) 
$$\frac{dy}{dx} = -\frac{12}{5}ax^{-\frac{1}{5}}$$
$$= -\frac{12a}{5x^{\frac{1}{5}}}$$

17) 
$$f'(x) = -8x^{-3}$$
  
=  $-\frac{8}{x^3}$ 

17) 
$$f'(x) = -8x^{-3}$$
  
 $= -\frac{8}{x^3}$   
18)  $f'(x) = -\frac{4}{3}cx^{-\frac{2}{3}}$   
 $= -\frac{4c}{\frac{2}{3}}$ 

$$19) f'(x) = -3a$$

$$20) \frac{dy}{dx} = -2x^{-3}$$
$$= -\frac{2}{x^3}$$

$$x^{3} = -\frac{4c}{3}x^{\frac{2}{3}}$$

$$= -\frac{4c}{3}x^{\frac{2}{3}}$$

$$= 1 - \frac{4}{5}x^{\frac{1}{5}}\sqrt{3}$$

$$= \frac{4\sqrt{3}}{5x^{\frac{1}{5}}}$$

$$= \frac{1}{3} - \frac{3}{4}$$

$$= \frac{1}{3} - \frac{3}{4}$$

$$= \frac{1}{3} - \frac{3}{4}$$

$$= \frac{4}{5}x^{-\frac{1}{5}}\sqrt{3}$$

$$= \frac{4\sqrt{3}}{5x^{\frac{1}{5}}}$$

$$= \frac{1}{4}x^{-\frac{3}{4}}$$

$$= \frac{1}{4}x^{\frac{3}{4}}$$

$$23) \ \frac{dy}{dx} = -3x$$

24) 
$$f'(x) = 2x^{-\frac{3}{5}}$$

$$= \frac{2}{x^{\frac{3}{5}}}$$