

Practice Exercises

Date _____ Period _____

Differentiate each function with respect to x .

1) $y = \cos^{-1} 2x^3$

2) $y = \sin^{-1} 2x^2$

3) $y = \sin^{-1} -2x^3$

4) $y = \cos^{-1} x^2$

5) $y = \cos^{-1} 4x^2$

6) $y = \tan^{-1} -5x^4$

7) $y = \cos^{-1} -x^4$

8) $y = \tan^{-1} 5x^2$

$$9) y = \tan^{-1} 4x^2$$

$$10) y = \tan^{-1} 3x^2$$

$$11) y = \sin^{-1} 5x^5$$

$$12) y = \cos^{-1} 4x^5$$

$$13) y = \sin^{-1} -2x^3$$

$$14) y = \cos^{-1} 4x^4$$

$$15) y = \sin^{-1} 3x^2$$

Answers to Practice Exercises (ID: 1)

$$1) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(2x^3)^2}} \cdot 6x^2$$

$$= -\frac{6x^2}{\sqrt{1-4x^6}}$$

$$2) \frac{dy}{dx} = \frac{1}{\sqrt{1-(2x^2)^2}} \cdot 4x$$

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

$$3) \frac{dy}{dx} = \frac{1}{\sqrt{1-(-2x^3)^2}} \cdot -6x^2$$

$$= -\frac{6x^2}{\sqrt{1-4x^6}}$$

$$4) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(x^2)^2}} \cdot 2x$$

$$= -\frac{2x}{\sqrt{1-x^4}}$$

$$5) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(4x^2)^2}} \cdot 8x$$

$$= -\frac{8x}{\sqrt{1-16x^4}}$$

$$6) \frac{dy}{dx} = \frac{1}{(-5x^4)^2 + 1} \cdot -20x^3$$

$$= -\frac{20x^3}{25x^8 + 1}$$

$$7) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(-x^4)^2}} \cdot -4x^3$$

$$= \frac{4x^3}{\sqrt{1-x^8}}$$

$$8) \frac{dy}{dx} = \frac{1}{(5x^2)^2 + 1} \cdot 10x$$

$$= \frac{10x}{25x^4 + 1}$$

$$9) \frac{dy}{dx} = \frac{1}{(4x^2)^2 + 1} \cdot 8x$$

$$= \frac{8x}{16x^4 + 1}$$

$$10) \frac{dy}{dx} = \frac{1}{(3x^2)^2 + 1} \cdot 6x$$

$$= \frac{6x}{9x^4 + 1}$$

$$11) \frac{dy}{dx} = \frac{1}{\sqrt{1-(5x^5)^2}} \cdot 25x^4$$

$$= \frac{25x^4}{\sqrt{1-25x^{10}}}$$

$$12) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(4x^5)^2}} \cdot 20x^4$$

$$= -\frac{20x^4}{\sqrt{1-16x^{10}}}$$

$$13) \frac{dy}{dx} = \frac{1}{\sqrt{1-(-2x^3)^2}} \cdot -6x^2$$

$$= -\frac{6x^2}{\sqrt{1-4x^6}}$$

$$14) \frac{dy}{dx} = -\frac{1}{\sqrt{1-(4x^4)^2}} \cdot 16x^3$$

$$= -\frac{16x^3}{\sqrt{1-16x^8}}$$

$$15) \frac{dy}{dx} = \frac{1}{\sqrt{1-(3x^2)^2}} \cdot 6x$$

$$= \frac{6x}{\sqrt{1-9x^4}}$$