

## Differentiation of Sin/Cos/Tan

Date \_\_\_\_\_ Period \_\_\_\_\_

**Differentiate each function with respect to the given variable.**

1)  $r = \cos 10x^6$

2)  $t = \sin 3r^8$

3)  $g = \tan 4x^4$

4)  $f = \tan 7s^5$

5)  $s = \cos 6r^6$

6)  $g = \sin 10s^3$

7)  $y = \sin 2r^2$

8)  $r = \sin 5x^{10}$

$$9) r = \cos 9x^4$$

$$10) g = \sin 7r^4$$

$$11) y = \tan 5x^4$$

$$12) g = \cos x^9$$

$$13) h = \cos 8s^8$$

$$14) t = \sin 4s^8$$

$$15) t = \cos 3x^5$$

$$16) r = \sin 8x^7$$

## Differentiation of Sin/Cos/Tan

Date \_\_\_\_\_ Period \_\_\_\_\_

**Differentiate each function with respect to the given variable.**

1)  $r = \cos 10x^6$

$$\begin{aligned}\frac{dr}{dx} &= -\sin 10x^6 \cdot 60x^5 \\ &= -60x^5 \sin 10x^6\end{aligned}$$

2)  $t = \sin 3r^8$

$$\begin{aligned}\frac{dt}{dr} &= \cos 3r^8 \cdot 24r^7 \\ &= 24r^7 \cos 3r^8\end{aligned}$$

3)  $g = \tan 4x^4$

$$\begin{aligned}\frac{dg}{dx} &= \sec^2 4x^4 \cdot 16x^3 \\ &= 16x^3 \sec^2 4x^4\end{aligned}$$

4)  $f = \tan 7s^5$

$$\begin{aligned}\frac{df}{ds} &= \sec^2 7s^5 \cdot 35s^4 \\ &= 35s^4 \sec^2 7s^5\end{aligned}$$

5)  $s = \cos 6r^6$

$$\begin{aligned}\frac{ds}{dr} &= -\sin 6r^6 \cdot 36r^5 \\ &= -36r^5 \sin 6r^6\end{aligned}$$

6)  $g = \sin 10s^3$

$$\begin{aligned}\frac{dg}{ds} &= \cos 10s^3 \cdot 30s^2 \\ &= 30s^2 \cos 10s^3\end{aligned}$$

7)  $y = \sin 2r^2$

$$\begin{aligned}\frac{dy}{dr} &= \cos 2r^2 \cdot 4r \\ &= 4r \cos 2r^2\end{aligned}$$

8)  $r = \sin 5x^{10}$

$$\begin{aligned}\frac{dr}{dx} &= \cos 5x^{10} \cdot 50x^9 \\ &= 50x^9 \cos 5x^{10}\end{aligned}$$

$$9) r = \cos 9x^4$$

$$\begin{aligned}\frac{dr}{dx} &= -\sin 9x^4 \cdot 36x^3 \\ &= -36x^3 \sin 9x^4\end{aligned}$$

$$10) g = \sin 7r^4$$

$$\begin{aligned}\frac{dg}{dr} &= \cos 7r^4 \cdot 28r^3 \\ &= 28r^3 \cos 7r^4\end{aligned}$$

$$11) y = \tan 5x^4$$

$$\begin{aligned}\frac{dy}{dx} &= \sec^2 5x^4 \cdot 20x^3 \\ &= 20x^3 \sec^2 5x^4\end{aligned}$$

$$12) g = \cos x^9$$

$$\begin{aligned}\frac{dg}{dx} &= -\sin x^9 \cdot 9x^8 \\ &= -9x^8 \sin x^9\end{aligned}$$

$$13) h = \cos 8s^8$$

$$\begin{aligned}\frac{dh}{ds} &= -\sin 8s^8 \cdot 64s^7 \\ &= -64s^7 \sin 8s^8\end{aligned}$$

$$14) t = \sin 4s^8$$

$$\begin{aligned}\frac{dt}{ds} &= \cos 4s^8 \cdot 32s^7 \\ &= 32s^7 \cos 4s^8\end{aligned}$$

$$15) t = \cos 3x^5$$

$$\begin{aligned}\frac{dt}{dx} &= -\sin 3x^5 \cdot 15x^4 \\ &= -15x^4 \sin 3x^5\end{aligned}$$

$$16) r = \sin 8x^7$$

$$\begin{aligned}\frac{dr}{dx} &= \cos 8x^7 \cdot 56x^6 \\ &= 56x^6 \cos 8x^7\end{aligned}$$