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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{dy}{dr} = \cos 2r^2 \cdot 4r$$
$$= 4r \cos 2r^2$$

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

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

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

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

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

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

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

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

12) $g = \cos x^9$

$$\frac{dg}{dx} = -\sin x^9 \cdot 9x^8$$
$$= -9x^8 \sin x^9$$

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

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

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

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

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

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

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

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