

9.3

~~MSDU~~

Name \_\_\_\_\_

© 2014 Kuta Software LLC. All rights reserved.

## SUM, DIFFERENCE, DOUBLE & HALF ANGLE IDENTITIES

Use the angle sum identity to find the exact value of each.

1)  $\tan \frac{17\pi}{12}$

2)  $\sin \frac{19\pi}{12}$

3)  $\tan \frac{13\pi}{12}$

4)  $\sin \frac{7\pi}{12}$

5)  $\tan \frac{7\pi}{12}$

6)  $\cos \frac{7\pi}{12}$

7)  $\sin \frac{17\pi}{12}$

8)  $\tan \frac{19\pi}{12}$

9)  $\cos \frac{13\pi}{12}$

10)  $\sin \frac{13\pi}{12}$

11)  $\tan \frac{11\pi}{12}$

12)  $\cos \frac{17\pi}{12}$

13)  $\tan \frac{5\pi}{12}$

14)  $\sin \frac{11\pi}{12}$

15)  $\sin \frac{5\pi}{12}$

16)  $\cos \frac{5\pi}{12}$

17)  $\cos \frac{11\pi}{12}$

18)  $\cos \frac{19\pi}{12}$

**Use the angle difference identity to find the exact value of each.**

19)  $\sin -\frac{\pi}{12}$

20)  $\cos -\frac{7\pi}{12}$

21)  $\cos \frac{7\pi}{12}$

22)  $\tan -\frac{7\pi}{12}$

23)  $\sin \frac{7\pi}{12}$

24)  $\sin \frac{\pi}{12}$

25)  $\tan -\frac{\pi}{12}$

26)  $\cos -\frac{\pi}{12}$

27)  $\tan -\frac{5\pi}{12}$

28)  $\cos \frac{\pi}{12}$

29)  $\cos \frac{5\pi}{12}$

30)  $\tan \frac{7\pi}{12}$

31)  $\sin -\frac{5\pi}{12}$

32)  $\tan \frac{\pi}{12}$

33)  $\sin \frac{5\pi}{12}$

34)  $\cos -\frac{5\pi}{12}$

35)  $\sin -\frac{7\pi}{12}$

36)  $\tan \frac{5\pi}{12}$

Use a double-angle identity to find the exact value of each expression.

37)  $\sin \theta = \frac{4\sqrt{21}}{21}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\cos 2\theta$

38)  $\cos \theta = \frac{4}{5}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\sin 2\theta$

39)  $\cos \theta = \frac{24}{25}$  and  $\frac{3\pi}{2} < \theta < 2\pi$   
Find  $\tan 2\theta$

40)  $\tan \theta = \frac{8}{15}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\cos 2\theta$

41)  $\sin \theta = \frac{3\sqrt{10}}{10}$  and  $\frac{\pi}{2} < \theta < \pi$   
Find  $\cos 2\theta$

42)  $\sin \theta = -\frac{3}{5}$  and  $\frac{3\pi}{2} < \theta < 2\pi$   
Find  $\cos 2\theta$

43)  $\tan \theta = -\frac{3}{4}$  and  $\frac{\pi}{2} < \theta < \pi$   
Find  $\sin 2\theta$

44)  $\sin \theta = -\frac{7}{25}$  and  $\pi < \theta < \frac{3\pi}{2}$   
Find  $\cos 2\theta$

45)  $\tan \theta = \frac{3}{4}$  and  $\pi < \theta < \frac{3\pi}{2}$   
Find  $\tan 2\theta$

46)  $\tan \theta = -\frac{3}{4}$  and  $\frac{\pi}{2} < \theta < \pi$   
Find  $\tan 2\theta$

47)  $\tan \theta = -\frac{3}{4}$  and  $\frac{3\pi}{2} < \theta < 2\pi$   
Find  $\tan 2\theta$

48)  $\tan \theta = 2\sqrt{6}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\tan 2\theta$

49)  $\cos \theta = \frac{2\sqrt{42}}{17}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\sin 2\theta$

50)  $\tan \theta = \frac{7}{24}$  and  $\pi < \theta < \frac{3\pi}{2}$   
Find  $\cos 2\theta$

51)  $\cos \theta = -\frac{4}{5}$  and  $\pi < \theta < \frac{3\pi}{2}$   
Find  $\sin 2\theta$

52)  $\sin \theta = \frac{3}{5}$  and  $0 < \theta < \frac{\pi}{2}$   
Find  $\tan 2\theta$

$$53) \tan \theta = \frac{3}{4} \text{ and } 0 < \theta < \frac{\pi}{2}$$

Find  $\tan 2\theta$

$$54) \sin \theta = \frac{6}{23} \text{ and } 0 < \theta < \frac{\pi}{2}$$

Find  $\tan 2\theta$

**Use a half-angle identity to find the exact value of each expression.**

$$55) \tan \theta = -\frac{5}{12} \text{ and } 270^\circ < \theta < 360^\circ$$

Find  $\cos \frac{\theta}{2}$

$$56) \sin \theta = -\frac{7}{25} \text{ and } 180^\circ < \theta < 270^\circ$$

Find  $\cos \frac{\theta}{2}$

$$57) \cos \theta = -\frac{15}{17} \text{ and } 90^\circ < \theta < 180^\circ$$

Find  $\cos \frac{\theta}{2}$

$$58) \tan \theta = \frac{3}{4} \text{ and } 0^\circ < \theta < 90^\circ$$

Find  $\tan \frac{\theta}{2}$

$$59) \sin \theta = -\frac{3}{5} \text{ and } 180^\circ < \theta < 270^\circ$$

Find  $\sin \frac{\theta}{2}$

$$60) \tan \theta = \frac{\sqrt{6}}{12} \text{ and } 180^\circ < \theta < 270^\circ$$

Find  $\cos \frac{\theta}{2}$

$$61) \cos \theta = \frac{4}{5} \text{ and } 0^\circ < \theta < 90^\circ$$

Find  $\tan \frac{\theta}{2}$

$$62) \cos \theta = \frac{15}{17} \text{ and } 270^\circ < \theta < 360^\circ$$

Find  $\sin \frac{\theta}{2}$

63)  $\sin \theta = \frac{5}{13}$  and  $0^\circ < \theta < 90^\circ$   
Find  $\sin \frac{\theta}{2}$

64)  $\cos \theta = \frac{12}{13}$  and  $270^\circ < \theta < 360^\circ$   
Find  $\tan \frac{\theta}{2}$

65)  $\tan \theta = \frac{3}{2}$  and  $180^\circ < \theta < 270^\circ$   
Find  $\tan \frac{\theta}{2}$

66)  $\tan \theta = \frac{3}{4}$  and  $0^\circ < \theta < 90^\circ$   
Find  $\cos \frac{\theta}{2}$

67)  $\tan \theta = -\frac{\sqrt{3}}{3}$  and  $270^\circ < \theta < 360^\circ$   
Find  $\tan \frac{\theta}{2}$

68)  $\cos \theta = -\frac{15}{17}$  and  $180^\circ < \theta < 270^\circ$   
Find  $\tan \frac{\theta}{2}$

69)  $\tan \theta = -\frac{3}{5}$  and  $270^\circ < \theta < 360^\circ$   
Find  $\sin \frac{\theta}{2}$

70)  $\sin \theta = -\frac{3}{5}$  and  $270^\circ < \theta < 360^\circ$   
Find  $\cos \frac{\theta}{2}$

71)  $\cos \theta = \frac{4}{5}$  and  $270^\circ < \theta < 360^\circ$   
Find  $\cos \frac{\theta}{2}$

72)  $\tan \theta = 1$  and  $0^\circ < \theta < 90^\circ$   
Find  $\sin \frac{\theta}{2}$