

Section 5.4 – Review of Sum and Difference Formulas

$$\sin(\theta + \beta) = \sin\theta\cos\beta + \cos\theta\sin\beta$$

$$\sin(\theta - \beta) = \sin\theta\cos\beta - \cos\theta\sin\beta$$

$$\cos(\theta + \beta) = \cos\theta\cos\beta - \sin\theta\sin\beta$$

$$\cos(\theta - \beta) = \cos\theta\cos\beta + \sin\theta\sin\beta$$

$$\tan(\theta + \beta) = \frac{\tan\theta + \tan\beta}{1 - \tan\theta\tan\beta}$$

$$\tan(\theta - \beta) = \frac{\tan\theta - \tan\beta}{1 + \tan\theta\tan\beta}$$

Find the EXACT value of the following using sum and difference formulas:

1) $\sin(15^\circ)$

2) $\tan(75^\circ)$

3) $\cos(195^\circ)$

4) $\sin(165^\circ)$

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5) $\sin(-75^\circ)$

6) $\tan(345^\circ)$

7) $\cos(285^\circ)$

8) $\sin(105^\circ)$

Write as sine, cosine, or tangent of an angle. You do NOT have to find the value:

9) $\sin(42^\circ)\cos(17^\circ) - \cos(42^\circ)\sin(17^\circ)$

10) $\cos 45^\circ \cos 120^\circ - \sin 45^\circ \sin 120^\circ$

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$$11) \frac{\tan(19^\circ) + \tan(47^\circ)}{1 - \tan(19^\circ)\tan(47^\circ)}$$

$$12) \sin 60^\circ \cos 45^\circ - \cos 60^\circ \sin 45^\circ$$

$$13) \cos(94^\circ)\cos(18^\circ) + \sin(94^\circ)\sin(18^\circ)$$

$$14) \frac{\tan 25^\circ + \tan 10^\circ}{1 - \tan 25^\circ \tan 10^\circ}$$

$$15) \frac{\tan 68^\circ - \tan 115^\circ}{1 + \tan 68^\circ \tan 115^\circ}$$

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16) Find the EXACT value of the trig function given that

$$\sin u = \frac{-8}{17} \quad \cos v = \frac{4}{5} \text{ and both angles are in Quadrant IV}$$

a) $\tan(u-v)$

b) $\cos(u+v)$

17) Find the **exact value** of the trig function given that

$$\sin u = \frac{-3}{5} \text{ and } \cos v = \frac{-5}{13} \text{ where both } u \text{ and } v \text{ are in Quadrant III.}$$

a) $\sin(u-v)$

b) $\cos(u-v)$

c) $\tan(u+v)$