

Aim: What are the trigonometric sum and difference identities?**I. Do Now:**

1. The cosine of the difference of two angles may be found using the identity at the right. Use this identity to find $\cos(90^\circ - 30^\circ)$.

2. Find $\cos(-y)$.

3. Find the value of each:

$$\sin(30^\circ) = \underline{\hspace{2cm}}$$

$$\sin(-30^\circ) = \underline{\hspace{2cm}}$$

$$\sin(120^\circ) = \underline{\hspace{2cm}}$$

$$\sin(-120^\circ) = \underline{\hspace{2cm}}$$

$$\sin(-y) = \underline{\hspace{2cm}}$$

Angle Sum and Difference Identities

$$\cos(x - y) = \cos x \cos y + \sin x \sin y$$

$$\cos(x + y) =$$

$$\sin(x - y) =$$

$$\sin(x + y) =$$

$$\tan(x - y) =$$

$$\tan(x + y) =$$

II. Angle Sum Identity for Cosine**IV. Angle Sum & Difference Identities for Tangent****III. Angle Sum & Difference Identities for Sine**

Use the identity $\sin x = \cos(90^\circ - x)$.

V. Applications.

1. Find the exact value of $\sin 75^\circ$.

3. If $\sin A = -\frac{4}{5}$, $\tan B = \frac{5}{12}$, and angles A and B are in Quadrant III, find the exact values of $\sin(A + B)$, $\cos(A + B)$, and $\tan(A + B)$.

2. Without using a calculator, evaluate:

(a) $\cos 40^\circ \cos 10^\circ + \sin 40^\circ \sin 10^\circ$

(b) $\sin 65^\circ \cos 20^\circ - \cos 65^\circ \sin 20^\circ$

(c) $\frac{\tan 80^\circ - \tan 20^\circ}{1 + \tan 80^\circ \tan 20^\circ}$

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- p. 440: 11, 14, 18, 20, 24, 25, 26
- p. 455: 1, 10, 11, 35, 36, 37