

November 19

What is the  $\sin(30)$ ?  $= .5 = \frac{1}{2}$

What is the  $\sin(45)$ ?  $= .707 = \frac{\sqrt{2}}{2}$

What is the  $\sin(75)$ ?  $= .965$

Is that what you expected?

Why or why not?

$$30 + 45 = 75$$

$$\sin(75) \neq \sin(30) + \sin(45)$$



November 19

Students will verbally explain how to  
use the sum and difference formulas

(using the words:  
identity, reciprocal, quotient ...)



### Sum and Difference Formulas:

$$\sin(u - v) = \sin u \cos v - \cos u \sin v$$

$$\cos(u - v) = \cos u \cos v + \sin u \sin v$$

$$\cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$\tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

Which of the following is equivalent to  $\sin(45 + 30)$ ?

$\sin(u + v)$

- ☐  $\sin(45) + \sin(30)$
- ☒  $\sin(45)\cos(30) + \cos(45)\sin(30)$
- ☐  $\sin(45)\cos(30) - \cos(45)\sin(30)$
- ☐  $\sin(45)\sin(30) + \cos(45)\cos(30)$

$$\sin(u + v) = \sin u \cos v + \cos u \sin v$$

$$= \sin(45)\cos(30) + \cos(45)\sin(30)$$

### Sum and Difference Formulas:

$$\sin(u + v) = \sin u \cos v + \cos u \sin v$$

$$\cos(u - v) = \cos u \cos v + \sin u \sin v$$

$$\cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$\tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

Which is equivalent to  $\sin(30)\cos(20) - \cos(30)\sin(20)$ ?

$\sin(u)\cos(v) - \cos(u)\sin(v)$

☐  $\sin(50)$

☐  $\cos(50)$

☒  $\sin(10)$

☐  $\cos(10)$

$$\sin(u - v) = \sin u \cos v - \cos u \sin v$$

$$= \sin(30 - 20)$$

$$= \sin(10)$$

### Sum and Difference Formulas:

$$\sin(u - v) = \sin u \cos v - \cos u \sin v \quad \cos(u - v) = \cos u \cos v + \sin u \sin v \quad \tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

$$\sin(u + v) = \sin u \cos v + \cos u \sin v$$

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

Which is equivalent to  $\cos\left(\frac{7\pi}{12}\right)$ ?

- ☐  $\cos\left(\frac{\pi}{4}\right) + \cos\left(\frac{\pi}{3}\right)$
- ☒  $\cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{3}\right) - \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{3}\right)$
- ☐  $\cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{3}\right) + \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{3}\right)$

$$\begin{aligned}\frac{7\pi}{12} &= \frac{3\pi}{12} + \frac{4\pi}{12} \\ &= \frac{\pi}{4} + \frac{\pi}{3}\end{aligned}$$

$$\cos\left(\frac{7\pi}{12}\right) = \cos\left(\frac{\pi}{4} + \frac{\pi}{3}\right)$$

$$\cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$\begin{aligned}\cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{3}\right) - \\ \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{3}\right)\end{aligned}$$

### Sum and Difference Formulas:

$$\sin(u - v) = \sin u \cos v - \cos u \sin v$$

$$\sin(u + v) = \sin u \cos v + \cos u \sin v \quad \cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$\tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

Which is equivalent to  $\cos(3x - y)$ ?

- ☐  $\cos(3x) + \cos(y)$
- ☒  $\cos(3x)\cos(y) + \sin(3x)\sin(y)$
- ☐  $\cos(3x)\cos(y) - \sin(3x)\sin(y)$
- ☐  $\cos(3xy)$

$$\cos(u - v) = \cos u \cos v + \sin u \sin v$$

$$\begin{aligned}\cos(3x)\cos(y) + \\ \sin(3x)\sin(y)\end{aligned}$$

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Pick one:

#11 – 31 (odd)

OR

#11 – 44 (every 3<sup>rd</sup> problem)