

Any question asking for an exact answer will be marked wrong and receive no credit if there are decimal approximations in any step in the problem. Specific formulas are to be used in each of the problems. Any other attempt to work these problems without use of these formulas from the sections we have covered or correct deviations of those formulas will not receive any credit.

- (1) Use the **addition or subtraction formulas** to **find exact solutions** of the equation that are in the interval $[0, 2\pi)$.

$$\sin(5x) \cos(2x) = 1 + \sin(2x) \cos(5x)$$

- (2) Verify the identity.

$$\frac{\cos(u) \cos(v)}{\sin(u+v) - \sin(u-v)} = \frac{1}{2} \cot(v)$$

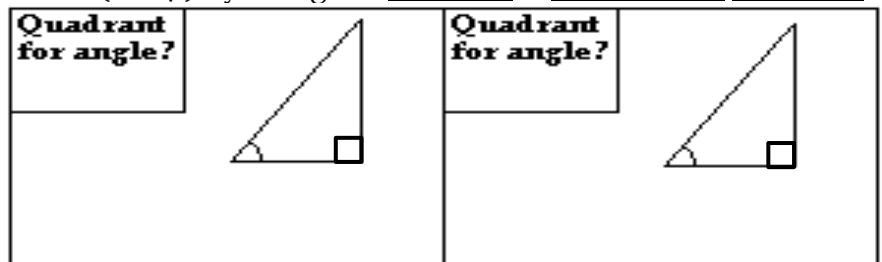
- (3) Using the **addition or subtraction trigonometric formulas**.

- (a) Find the exact value for $\sin(15^\circ)$

- (b) Find the exact value for $\cos(15^\circ)$

- (c) Demonstrate that the product of the results of (3)(a) and (3)(b) is equal to $\frac{1}{4}$.

- (4) If $\sin(\alpha) = \frac{4}{5}$ and $\cot(\beta) = -\frac{3}{2}$ for a first-quadrant angle α and a second-quadrant angle β , find an exact value for $\tan(\alpha + \beta)$ by using the **addition or subtraction formulas**.



$$\tan(\alpha + \beta) =$$

Extra Credit:

(1) In the above # (4), **what** quadrant is angle " $\alpha + \beta$ " in?

(2) **Verify** $\tan\left(\frac{3\pi}{2} - u\right) = \cot(u)$

(3) In a 6-story building with steps going between the floors, where would the halfway point between the 1st floor (ground floor) and the 6th floor be ?